



सत्यमेव जयते

Draft Guidelines For Examination Of Patent Applications In The Field Of Pharmaceuticals



**INTELLECTUAL
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***Office of the Controller General of
Patents, Designs and Trademarks***

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1. Development of pharmaceutical patenting in India

- 1.1 Pharmaceutical patenting is an extremely important aspect of India's Patent system. At the time of Independence, India's patent regime was governed by the Patents and Designs Act, 1911, which had provisions both for product and process patents. It was felt that there was a need for a change in the existing patent law since it had not helped in the promotion of scientific research and industrialization in the country.
- 1.2 Immediately after independence, a Committee headed by Justice (Dr.) Bakshi Tek Chand, a retired judge of the Lahore High Court, was constituted to undertake a comprehensive review of the working of the 1911 Act (1948-50). The Committee submitted its interim report on August 4, 1949 and the final report in 1950 making recommendations for prevention of misuse or abuse of patent rights in India. The Committee also recounted that the Patent Act should contain a clear indication that food and medicine and surgical and curative devices were to be made available to the public at the cheapest price while giving reasonable compensation to the patentee. Based on the recommendations of the Committee, amendments were made in the Patents and Designs Act, 1911, first in 1950 (by Act XXXII of 1950) in relation to working of inventions, including compulsory licensing and revocation of patents, and then in 1952, (by Act LXX of 1952) to provide for compulsory license for food and medicines, insecticide, germicide or fungicide, and for the process for producing substance or any invention relating to surgical or curative devices.
- 1.3 Subsequent to that, another Committee under Justice Ayyanger (1957-59) was constituted. Justice Ayyanger's report specially discussed (a) patents for chemical inventions and (b) patents for inventions relating to food and medicine. After thoroughly examining the contemporary law of patents governing inventions on chemical substances of different countries the Committee recommended that only process claims be allowed. For foods and medicines, the Committee recommended that inventions related to foods and medicines including insecticides and fungicides etc. should not be patentable as such and processes for their productions should alone be patentable.
- 1.4 On the basis of these reports and other deliberations, the Patents Act 1970 was enacted and came into force from 1972. The Patents Act 1970 allowed process patents for drugs, foods and products of chemical reactions but no product patents were allowed for inventions related to such substances [Section 5 of the Patents Act 1970]. The definition of Drugs included pesticides and insecticides. Also, the term of patents, for processes related to drugs and foods, was reduced to a maximum of seven years as opposed to fourteen years for the general category patents. During the period 1970-1994, the Indian pharmaceutical industry became nearly self-sufficient and one of the largest exporters of generic medicines. A large number of developing countries depend upon the supply of cheaper generic medicines from India.
- 1.5 The 1990s marked the beginning of a new era in the world economy. From the Uruguay round of General Agreement on Tariffs and Trade, emerged the World Trade Organization (WTO), integrating IPR laws in international trade in a comprehensive manner. The WTO agreement, of which India is a signatory, came into force from

01.01.1995. TRIPs (Trade Related Aspects of Intellectual Properties) agreement (Annexure 1C of the WTO agreement) under Article 27, required introduction of both product and process patenting in all fields of technology including drugs, foods, products of chemical reactions and micro-organisms.

- 1.6 To introduce product patents, TRIPs, under Article 65, allowed a ten years transition period for developing countries which did not have product patenting. However, for such developing countries like India, an interim measure was required to be adopted for pharmaceutical and agrochemical product related applications. Article 70.8 of TRIPs stipulated that such countries were required to introduce mail-box provisions for receiving applications claiming products in the relevant field. Also Article 70.9 mandated that Exclusive Marketing Rights (EMR) were to be made available for such applications subject to certain conditions for a term of five years from the date of grant of such rights or till the grant or rejection of patents claiming such products.
- 1.7 Accordingly, after the WTO agreement, the Patents Act 1970 was amended in a phase-wise manner in 1999, 2002 and in 2005 in conformity with the TRIPs agreement.
- 1.8 In 1999 mail-box and EMR provisions were introduced in India. Erstwhile Section 5 of the Patents Act 1970 was bifurcated to create a new Section 5(2) (mailbox provision) to receive applications claiming pharmaceuticals and agrochemicals product and a new chapter IVA was introduced to deal with EMR applications.
- 1.9 By the 2002 amendments, the term of all patents was uniformly made twenty years.
- 1.10 After the introduction of product patenting in 2005, mail-box and EMR provisions [Section 5 and Chapter IVA of the Patents Act 1970] were deleted and consequently product patents have been made available for inventions related to pharmaceuticals, agrochemicals, foods and products of chemical reactions since 01.01.2005.
- 1.11 While introducing the amendments, utmost care was taken to protect the public health and nutrition. Also, provisions for both pre- and post-grant oppositions were engrafted in the Patents Act.
- 1.12 Other than the WTO agreement, India is signatory to various international agreements which, *inter alia*, have bearing on patenting in pharmaceuticals. These include Paris Convention (since 1998), Patent Cooperation Treaty (since 1998) and Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (since 2001), Convention on Biological Diversity 1992 (CBD). The amendments of the Patents Act 1970 were also calibrated to recognize India's accession to these treaties.
- 1.13 In the wake of the public health crisis afflicting many developing and least-developed countries, especially those resulting from HIV/AIDS, tuberculosis, malaria and other epidemics, the ministerial conference of WTO adopted 'The Doha declaration on TRIPs and Public Health' (2001). The Doha declaration provided a mechanism for compulsory licensing to supply medicines to countries with insufficient or no-manufacturing capacities. The declaration also explicitly stressed that the TRIPs Agreement can and should be interpreted and implemented in a manner supportive of WTO members' right to protect public health and, in particular, to promote access to medicines for all.

Consequently, a provision (Section 92A) was introduced in the Patents Act for Compulsory Licensing for the purpose of export of pharmaceuticals products to any country having insufficient or no manufacturing capacity.

- 1.14 Convention of Biological Diversity (CBD) acknowledged the sovereign right of the nations on their genetic resources and mandated that the access to the genetic resources and any intellectual property derived there from should be subject to the benefit sharing accrued from such access. The CBD also warranted that the member states should protect their traditional and indigenous knowledge.
- 1.15 In consequence of the CBD, India passed the Biological Diversity Act, 2002 which provides a mechanism for access to the genetic resources and benefit sharing accrued therefrom. Section 6 of the Biological Diversity Act came into force on 1st July 2004, and prescribes that obtaining IPRs from the utilization of biological resources in India is subject to the approval of the National Biodiversity Authority (hereinafter referred to as NBA). To facilitate this access and benefit sharing and in order to prevent any unauthorized use of the biological resources of India, in 2005 suitable amendments were made in Section 10 of the Patents Act, 1970, wherein disclosure of the source and geographical origin of the biological material was made mandatory in an application for patent when the said material was used in an invention.
- 1.16 Pharmaceutical patenting in India is of utmost concern not only to the people of India, but also for the world community as India has emerged as "the pharmacy of the world". While traversing the history of the development of the legislation related to pharmaceuticals, Honorable Supreme Court referred to a letter written by the HIV/AIDS Director of the WHO, dated December 17, 2004, to the then Minister of Health and Family Welfare, Government of India. A part of the said letter is quoted herein below:

“As India is the leader in the global supply of affordable antiretroviral drugs and other essential medicines, we hope that the Indian government will take the necessary steps to continue to account for the needs of the poorest nations that urgently need access to anti-retrovirals, without adopting unnecessary restrictions that are not required under the TRIPS Agreement and that would impede access to medicines”.

- 1.17 Pharmaceutical patenting in India is therefore, an extremely important and sensitive issue since, while a bad pharmaceutical patent is a burden to society, good patents are also essential for promoting innovation and technological development in the country. Quality, consistency and uniformity of examination and grant of patents thereafter are, therefore, the top most priority concerns for the Patent Office. In order to achieve these targets the Patent Office is continuously upgrading its internal resources. Apart from updating its physical resources like revamping its internal work modules or its public interfaces, the Office, in an attempt to bring in quality, consistency and uniformity, has introduced guidelines for examination in certain key areas like traditional knowledge and biotechnology. Further, many of the issues related to the product patenting in the field of pharmaceuticals are now becoming clear through the decisions of the Courts. Therefore there is a need to develop guidelines for examination of pharmaceutical patents, incorporating the analysis of the Courts, with

the objective that the guidelines will help improve the examination standard and will introduce harmonious practice amongst the technical Officers of the system.

2. Scope of the present guidelines

The guidelines as set out below are supplemental to the practices and procedures followed by the Patent Office as published in the 'Manual of Patent Office Practice and Procedure', "Guidelines For Examination of Biotechnology Applications" and the "Guidelines For Processing of Patent Applications Relating to Traditional Knowledge and Biological Material". The present guidelines are prepared with the objective that the Guidelines will help the Examiners and the Controllers of the Patent Office in achieving consistently uniform standards of patent examination and grant. In case of any conflict between these Guidelines and the Patents Act, 1970 and the Rules made thereunder, the provisions of the Act and Rules will prevail.

3. Provisions covered

The following sections of the Patents Act, 1970 are emphasized in the context of examination of applications in pharmaceuticals and allied fields:

- a. Section 2 (1) (j): Novelty, inventive step & industrial applicability of products or processes,
- b. Section 3 specifies that the following are not patentable inventions within the meaning of the Act:
 - (i) Section 3 (b): Inventions contrary to morality or which cause serious prejudice to human, animal or plant life or health or environment,
 - (ii) Section 3 (c): Discovery of any living thing or non-living substance occurring in nature,
 - (iii) Section 3 (d): Mere discovery of new form of known substance which does not result in enhancement of known efficacy or mere discovery of any new property or new use for a known substance,
 - (iv) Section 3 (e): Mere admixture resulting only in aggregation of the properties of the components thereof or a process for producing such admixture,
 - (v) Section 3 (i): Method of treatment and diagnosis,
 - (vi) Section 3 (p): An invention which in effect is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components,
- c. Section 10 (4): Sufficiency of disclosure, the best method of performing the invention and claims defining the scope of invention, and
- d. Section 10 (5): Unity of invention and clarity, succinctness and support of the claims.

4. Claims of Pharmaceutical Inventions

4.1 The details of wording of claims, clarity, support and sufficiency of the disclosure are discussed under appropriate headings. However, for better understanding of the issues related to novelty and inventive step and other patentability criteria, a preliminary reference is made hereunder on claims of pharmaceuticals and allied inventions which are usually filed in patent applications of the relevant fields.

4.2 Generally, applications pertaining to pharmaceutical and allied subject-matters comprise the claims relating to the following subject matters, but not limited to:

I. *Product claims:*

i. *Pharmaceutical substances:*

a. *New Chemical Entities;*

b. *Formulations/Compositions;*

c. *Combinations/ dosage/dose;*

d. *New forms of known substance such as:*

Salts, Ethers and Esters; Polymorphs; Solvates, including hydrates; Clathrates; Stereoisomers; Enantiomers; Metabolites and pro-drugs; Conjugates; Pure forms; Particle size; Isomers and mixtures thereof; Complexes; Derivatives of known substances; and

ii. *Kits;*

iii. *Product-by-process.*

II. *Claims for process/method of manufacturing;*

III. *Claims related to new property, new use of known substance or use claims, including second indications;*

IV. *Claims for method of treatment and/or diagnosis of human beings and animals;*

V. *Claims related to selection inventions (relating to product and process)*

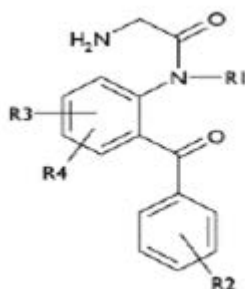
The Guidelines have been designed in such a manner that the explanations given with regard to the separate concepts such as novelty, inventive step, industrial use etc would be applicable generally to all the types of claims given above but where there seems to be a requirement of additional clarification or a different approach, an attempt has been made to explain it separately under the same conceptual head in the context of the pertinent provisions of law.

Markush claims

Often broad (“generic”) patent claims are drafted covering a family of a large number (sometimes thousands or millions) of possible compounds. The so-called ‘Markush claims’ refer to a chemical structure with plurality of functionally equivalent chemical groups in one or more parts of the compound. The Markush claims are drafted to obtain a wide scope of protection encompassing a large number of compounds whose properties might not have been tested, but only theoretically inferred from the equivalence with other compounds within the claim. Quite often the Markush claims generate confusions regarding the novelty, non-obviousness and industrial applicability of a group of compounds covered within the said Markush formula. Also, the Markush claims may invoke the questions of sufficiency and plurality of distinct group of inventions surrounding such claims.

Illustrative example:

Claim 1: The compounds of the general formula:



Wherein, R1 is selected from phenyl, pyridyl, thiazolyl, thioalkyl, alkoxy and methyl; R2-R4 are methyl, tolyl or phenyl... the compounds are used as a pharmaceutical for increasing the oxygen intaking capability of blood.

While examining above said Markush claims, the complete specification should be critically examined whether: (i) it discloses all the possible embodiments covered under the claimed Markush formula; (ii) such embodiments share a common use or property; (iii) such possible embodiments share common structure; (iv) physical and chemical properties of claimed compound are disclosed; (v) test conducted for each embodiment is provided; (vi) at least one process for preparing the compounds is disclosed when more than one processes are claimed.

Moreover, if any one of (i) to (vi) are not met such a Markush claims shall be objected under 'Unity of invention' and insufficiency of disclosure suitably.

5. Prior Art Search

- 5.1 While conducting a prior art search, the Examiner should design/frame a comprehensive search strategy by combining various search parameters including key words, IPC, compound searches, etc. and thorough search should be carried out in patent as well as non-patent databases.
- 5.2 The compounds can be searched and identified from the various databases by using several methods¹:
- a) Molecular formula and structural formula searching;
 - b) Name searching using IUPAC nomenclature;
 - c) Compound searching using CAS Registry Numbers;
 - d) Generic name searching (INN); and
 - e) Search using International Patent Classification (IPC).
- 5.3 It is to be noted that quite often the claims of the pharmaceutical compounds involve derivatives of known compounds having established pharmaceutical activities. Also, it has been observed that such pharmaceutical substances have already been assigned generic names (International Non-Proprietary Names, INN).When the patent specification under examination disclose such INNs, the examiner should search the prior art on the basis of such INNs as well.
- 5.4 In case it is found that the applicant claims the second use/indication of an already known pharmaceutical compound, the examiner should follow the same methodology and ask the applicant to disclose the INN of the said pharmaceutical substance.

6. What is an invention: Section 2 (1) (j)

- 6.1 According to Section 2 (1) (j) of the Act, an "invention" means a new product or process involving an inventive step and capable of industrial application. An invention will be patentable only if it is new in the light of prior art, or is not anticipated by prior art. From the plain reading of section 2(1)(j), it is amply clear that only products and/or processes for making pharmaceutical compounds are considered to be inventions under the said clause. Sometimes, it is observed that applicants file claims in the following manner:
- 1) Use of compounds in the treatment of -----
 - 2) Use of compound A in the process of preparing B.
 - 3) Use of compound A in the composition of -----
 - 4) A product of a known substance for the treatment of new disease (which is nothing but use/application claim).

¹Page 32 of Patent Information and Transparency:A Methodology for Patent Searches on Essential Medicines in Developing Countries, Published by United Nations Development Programme 304 E 45th Street New York, NY 10017, USA, www.undp.org

The above four categories of claims are not to be considered as inventions, since the claimed subject matter neither pertains to product nor to process. Further, an objection with regard to Section 3(i) would be invoked.

- 6.2 Also, it may be noted that sometimes such claimed inventions relate to the second use of already known compounds which have fallen in the public domain. Necessary care may be exercised to examine those cases in the light of Section 2(1)(j). Further, it should be borne in mind that finding the new property of an already known substance does not make the substance novel and/or inventive.

Illustrative example: In an Order, Hon'ble Intellectual Property Appellate Board (IPAB) rejected one such application. The application initially claimed the use of known Fumaric acid derivatives for a second medical indication. The examiner raised objections on two counts i.e. claims are not allowable under section 2(1)(j) in that the claims relate neither to product nor process and the compounds of the invention were admittedly known². Facing the objections the claims were amended to product claims, but the question of lacking in novelty was maintained. The Controller refused the application on the ground of lacking in novelty. Later, the IPAB upheld the decision of the Controller.

7. Assessment of Novelty:

- 7.1 **Section 2 (1)(I)** of the Act states that "new invention" means any invention or technology which has not been anticipated by publication in any document or used in the country or elsewhere in the world before the date of filing of patent application with complete specification, i.e., the subject matter has not fallen in public domain or that it does not form part of the state of the art'. For the purpose of ascertaining the novelty during the examination, the prior art is to be construed as prescribed under Section 2 (1)(I) and Section 13 (read with Sections 29 to 34) of the Act. The Manual of Patent Office Practice & Procedure has set out the guidelines for assessment of novelty of inventions (Chapter 8, Para 08.03.02) that may be referred to.
- 7.2 **Documents:** It should be noted that while assessing novelty (as distinct from inventive step), it is generally not permitted to combine separate items of prior art together. It is also not permissible to combine separate items belonging to different embodiments described in one and the same document, unless such combination has specifically been suggested or essentially linked to one another. For example, if a Markush formula covers innumerable compounds, there is every likelihood that certain compounds claimed in the application may fall within the ambit of one prior art and certain other compounds may fall within another prior art. In such cases, combination of prior arts vis-à-vis novelty is a logical step taken by an examiner.
- 7.3 **Relevant date of a prior document:** According to Section 2 (1) (w) of the Act, "priority date" has the meaning assigned to it by Section 11. In determining novelty, a prior document should be read as it would have been read by a person skilled in the art on

² In FUMAPHARM AG vs THE CONTROLLER OF PATENTS & DESIGNS, OA/6/2009/PT/KOL and Miscellaneous Petition No. 34/2011 in OA/6/2009/PT/KOL, ORDER (No. 73 of 2013)

the relevant date of the document. An invention will be patentable only if it is new in the light of prior art, or is not anticipated by prior art. The prior art includes all information and knowledge relating to the invention, which is available in any publication before the date of priority of the patent application. For the purpose of examination, an invention will not be new, if it forms part of the prior art or has entered in public domain. For anticipation, such publication must be before the date of priority of the patent application. Also, any application for patent filed in India, but published after the date of filing of a subsequent application for patent in India claiming the same subject-matter shall be treated as a prior art (i.e. prior claiming) to the said subsequent application provided that the previous application has earlier priority date. The prior art document must be enabling i.e. there should be a clear and unmistakable direction for the invention in the prior art.

7.4 **Implicit disclosure:** The lack of novelty must normally be clearly apparent from the explicit teaching of the prior art. However, if the said prior art discloses the claimed subject-matter in such implicit manner that it leaves no doubt in the mind of examiner as to the content of the prior art and the practical effect of its teaching, an objection regarding lack of novelty should be raised. For example, the invention claims halide salts of a compound whereas the prior art teaches the chloride salts of the same compound but does not explicitly disclose the other halide salts. However, it may be noted that the question of implicit disclosure is often a mixed issue of novelty and inventive step.

7.5 **Inherent anticipation:** Sometimes the prior art may inherently disclose the subject matter of an invention. "A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. The prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating prior art.....it is not necessary that inherent anticipation requires that a person of ordinary skill in the art at the time would have recognized the inherent disclosure. But it is necessary that the result is a necessary consequence of what was deliberately intended in the invention"³.

7.6 Illustrative examples for determination of novelty

Example 1:

The claimed invention relates to a class of heterocyclic compounds of Formula I which are used as mGluR1 enhancers. Prior art disclosed compounds with following general formula II.

Following substituents are selected from list of substituents disclosed in prior art to claim compound of formula I;

R¹ is hydrogen;

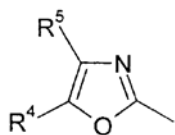
R², R^{2'} hydrogen or halogen (as R³ and R^{3'} of present invention);

³[paragraph 58 of the decision of the IPAB in Enercon (India) Limited vs Aloys Wobben ORA/6/2009/PT/CH, ORDER (No. 18 of 2013)].

X is O;

A¹, A² is **phenyl**;

B is 4,5-substitued oxazole

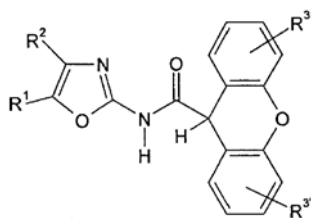


(b)

where R⁴ and R⁵ (as R¹ and R² of present invention) is **hydrogen** or **trifluoromethyl**, with the proviso that at least one of R⁴ or R⁵ has to be hydrogen.

Present Invention

1. Compounds of general formula



Formula I

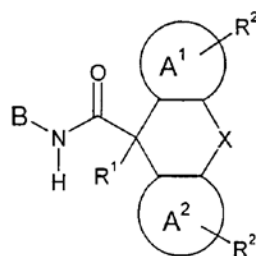
one of R1 and R2 signifies trifluoromethyl, and the other one signifies hydrogen;

R3, R 3' signify, independently from each other, hydrogen or halogen;

as well as pharmaceutically acceptable salts thereof.

Prior Art

1. A compound of general formula



Formula II

Wherein

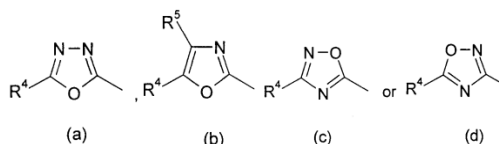
R1 signifies hydrogen or lower alkyl;

R2, R2' signify, independently from each other, hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl;

X signifies O, S or two hydrogen atoms not forming a bridge;

A1, A2 signify, independently from each other, phenyl or a 6-membered heterocycle

B is a group of formula

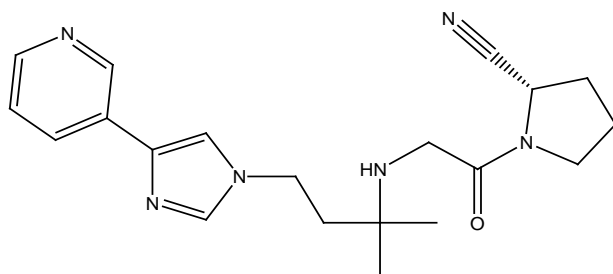


R4 and R5 signifies hydrogen, lower alkyl, lower alkoxy, cyclohexyl, lower alkyl- cyclohexyl or trifluoromethyl, with the proviso that at least one of R4 or R5 has to be hydrogen; as well as their pharmaceutically acceptable salts.

Analysis: It is to be seen from the prior art, whether compounds disclosed specifically are of such structures so that they can unambiguously take away the novelty of the compound(s) in question. It may be noted that the compound of the present invention as well as prior art compound is represented by Markush formulae. Since compounds of the present invention can be derived from the single prior art with all possible substituents, therefore it lacks novelty. Alternatively, if the compounds of prior art disclosed specifically do not take away the novelty of the compounds in question, then the generic disclosure in the prior art may still be cited for the purpose of inventive step.

Example 2:

The invention relates to the fumarate salt of (2S)-1-[[1,1-Dimethyl-3-(4-(pyridin-3-yl))-imidazol-1-yl]-propylamino]-acetyl]-pyrrolidine-2-carbonitrile useful for the treatment of diabetes mellitus, having the structure

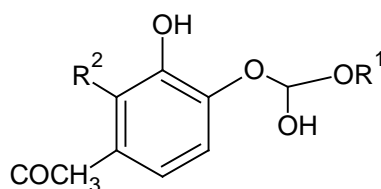


Prior art specifically discloses methanesulfonic acid salt of (2S)-1-[[1,1-Dimethyl-3-(4-pyridin-3-yl)-imidazol-1-yl]-propylamino]-acetyl]-pyrrolidine-2-carbonitrile. Further, it discloses "many pharmaceutically acceptable salts" of the said compound and also mentions many salt forming acids, among which fumaric acid was mentioned as one of the pharmaceutically acceptable salt forming acid. However, it does not specifically disclose the fumaric acid salt.

Analysis: The subject-matter of the claimed invention claiming fumaric acid salt of a compound (2S)-1-[[1,1-Dimethyl-3-(4-pyridin-3-yl)-imidazol-1-yl]-propylamino]-acetyl]-pyrrolidine-2-carbonitrile, the implicit disclosure of prior art anticipates the novelty of claimed subject-matter.

Example 3:

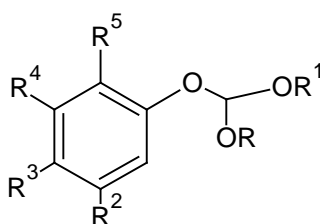
The invention relates to compound of Formula I and pharmaceutically acceptable salts thereof. Formula I are useful as agents in the treatment of diseases such as cancer.



Formula I

wherein R¹ is methyl; R² selected from hydrogen, amino, hydroxy, carboxy, C₁-C₃alkoxy, amino-C₁-C₃-alkyl, C₁ – C₇ alkyl, -C₁ – C₅haloalkyl.....

Prior art disclosed compound of Formula II and pharmaceutically acceptable salts for treating obesity, AIDS, and cancer.



Formula II

wherein R and R¹ is selected from hydrogen, C₁ – C₇ alkyl, C₁ – C₅haloalkyl, providing at least one of R and R₁ represents C₁ – C₇ alkyl;

R², R³, R⁴, R⁵ is selected from hydrogen, amino, hydroxy, carboxy, acyl, C₁-C₃alkoxy, amino-C₁-C₃alkyl -C₁ – C₇ alkyl, -C₁ – C₅haloalkyl, aryl, substituted aryl, heteroaryl.....

Analysis: Prior art implicitly disclosed C₁ – C₇ alkyl as one of the substituent for R¹, acyl group, hydroxyl, and other substituents for R², R³, and R⁵. Therefore claimed invention is not novel.

7.7 Combination/Composition Claims

Quite often, the claims of combination of pharmaceutical products escape the question of novelty and are dealt under the inventive step or relevant clauses of Section 3 of the Act. However, sometimes it may happen that the combination has already fallen in the public domain and hence, should be dealt under novelty also.

7.8 Illustrative Examples for determination of novelty for combination/composition claims:

Example 1:

Claimed invention relates to a composition for enhancing corneal healing said composition comprising vitamin A and a sterile buffer administered to the eye.

Prior art discloses the use of the eye-drops to rewet contact lenses, wherein said eye-drops comprising Vitamin A, the sterile buffer and other excipients.

Analysis: The claim lacks novelty, as being anticipated by the said prior art, which discloses all the features of claimed composition useful for enhancing corneal healing. Thus, the claimed subject matter lacks novelty.

Example 2:

Claim: A pharmaceutical formulation comprising a substantially clear aqueous solution characterized in that it has a viscosity of less than 10 mPa.s and contains 3.5 to 5% w/v of 1,3-bis(2-carboxychromon-5-yloxy)-propan-2-ol, or a pharmaceutically acceptable salt thereof as active ingredient, glycerol, and ions of metals of groups IA, IB, IIB and IVB of the periodic table or transition metals having the concentration of the ions less than 20 ppm.

The prior art (D1) describes a pharmaceutical formulation comprising an aqueous solution containing 2% w/v of 1,3-bis(2-carboxychromon-5-yloxy)-propan-2-ol sodium salt (sodium cromoglycate) as active ingredient and glycerol and method of preparing the same. Further, D1 indicates that the concentration of sodium cromoglycate may be from 0.1% w/v to 10% w/v and that it is preferred that the concentration of sodium cromoglycate be less than 5% w/v.

D1 does not mention *expressis verbis* that this pharmaceutical formulation is a substantially clear aqueous solution which has a viscosity of less than 10 mPa.s and that the concentration in the formulation of ions of metals of groups IA, IB, IIB and IVB of the periodic table or of transition metals is less than 20 ppm. However, these features were not distinguishing features over D1. There was a clear-cut similarity of the method of preparation of the pharmaceutical formulation according to application under question with that of D1, there was no reason to expect a different viscosity or a different metal content in the two formulations. Accordingly, the question was whether the range of 3.5 w/v to 5% w/v of sodium cromoglycate, could be regarded as novel over the disclosure of D1. D1 indicates that the concentration of sodium cromoglycate may be from 0.1% w/v to 10% w/v and that it is preferred that the concentration of sodium cromoglycate be less than 5% w/v.

Analysis: The skilled person will inevitably read the value of 5% w/v for the concentration of sodium cromoglycate. Accordingly, the claimed range of 3.5% w/v to 5% w/v is anticipated.

7.9 Product-by-process claims:

A claim to a product obtained or produced by a process is anticipated by any prior disclosure of that particular product *per se*, regardless of its method of production. In a product-by-process claim, by using only process terms, the applicant seeks rights to a product, not a process. The IPAB held in ORDER No. 200/2012“.....product-by-process claims must also define a novel and unobvious product, and that its patentability cannot depend on the novelty and unobviousness of the process limitations alone. Therefore, the patentability of a product by process claim is based on the product itself if it does not depend on the method of production. In other words, if the product-by-process claim is the same as or obvious from a prior product, the claim is un-patentable even if the prior art product was made by a different

process. Accordingly the product by process claim must define a novel and un-obvious product and the patentability in such claim cannot depend on the novelty and un-obviousness of the process limitation alone”⁴.

Therefore, in product-by-process claims, the applicant has to show that the product defined in process terms, is not anticipated or rendered obvious by any prior art product. In other words the product must qualify for novelty and inventive step irrespective of the novelty or inventive step of the process.

7.10 Illustrative Examples for determination of novelty for Product-by-process claims:

Example 1:

The patent application relates to “Ceramic based nanoparticles for entrapping therapeutic agents for photodynamic therapy and method of using the same”. The specification disclosed, in one embodiment, that the invention provided a method for the synthesis of photosensitizer dye/drug doped silica-based nanoparticles (diameter ~30 nm), by controlled alkaline hydrolysis of a ceramic material [such as triethoxyvinylsilane (VTES)] in micellar media and in another embodiment, the photosensitive drug/dye used was 2-devinyl-2-(1-hexyloxyethyl) pyropheophorbide (HPPH), an effective photosensitizer.

Claims 1 to 6 were for method of preparing ceramic nanoparticles loaded with drugs and claims 7 to 13 being composition claims. Claims 1 and 7 are reproduced below:-

1. A method of preparing ceramic nanoparticles loaded with one or more photosensitive drugs comprising the steps of:

- a) preparing micelles entrapping the photosensitive drugs;
- b) adding alkoxyorganosilane to the micelles to form complexes of silica and the micelles;
- c) subjecting the complexes of silica and micelles to alkaline hydrolysis to precipitate silica nanoparticles in which the photosensitive drug, molecules are entrapped; and
- d) isolating the precipitated nanoparticles by dialysis

7. A composition comprising ceramic nanoparticles in which one or more photosensitive drugs are entrapped by a method comprising; the steps of:

- a) preparing micelles entrapping the photosensitive drugs;
- b) adding alkoxyorganosilane to the micelles to form complexes of silica and the micelles ;
- c) subjecting the complexes of silica and micelles to alkaline hydrolysis to precipitate silica nanoparticles in which the photosensitive drug, molecules are entrapped; and
- d) isolating the precipitated nanoparticles by dialysis

⁴ The Research Foundation Of State University Of New York Vs Assistant Controller Of Patents [OA/11/2009/PT/DEL (ORDER No. 200/2012)]

Prior art (D1) is directed to use of photoluminescent nanoparticles for photodynamic therapy to address the problem of application of light of a suitable wavelength to a photodynamic drug (PDT). The solution suggested in D1 was the use of Light-Emitting nanoparticles to be administered in addition to PDT in order to activate the drug. It is taught that the Light Emitting Nanoparticles absorb light from the light source and re-emit lights at a different wavelength, which is suitable to activate the PDT drug in the vicinity of Light Emitting Nanoparticles. Thus, the role of nanoparticles is to absorb the light from a light source and re-emit the light of different wavelength to activate the PDT drug. To achieve this purpose, firstly, a PDT drug is to be administered; thereupon nanoparticles are administered and thereafter light source become active. The time gap between administration of PDT drug and administration of nanoparticles has been highlighted in the specification. The Controller refused the application on the ground of lacking in novelty.

Analysis of IPAB: IPAB found that D1 did not teach or formally suggested a method of synthesizing ceramic based nanoparticles entrapped with photosensitive drugs where the method involve steps restricted in claim 1. Thus, the method claims could be allowed. However, regarding the product-by- process claims, the IPAB was of the opinion that in the present case the PDT drug is same but only the carriers are different. Difference between prior art composition and claimed composition is in the use of non-bio-gradable carrier. In the prior art, the carrier is polyacrylamide non-degradable nanoparticles but in the claimed invention the carrier is ceramic based, which is also non-bio-degradable. The composition claimed has known constituents and beyond understanding to have any enhanced effect. The composition claims were refused by the IPAB.

8. ASSESSMENT OF INVENTIVE STEP:

- 8.1 **An invention should possess** an inventive step in order to be eligible for patent protection. As per the section 2(1)(j)(a) of Patents Act, an invention will have inventive step if the invention is (a) technically advanced as compared to existing knowledge or (b) having economic significance or (c) both, and that makes the invention not obvious to a person skilled in the art. Further, the Manual of Patent Office Practice & Procedure has set out the guidelines for assessment of Inventive Step of inventions (Chapter 8, Para 08.03.03).
- 8.2 The invention that creates the product must have a feature that involves technical advance as compared to the existing knowledge or having economic significance or both and this feature should be such as to make the invention not obvious to a person skilled in the art⁵.
- 8.3 Prior art for determining inventive step constitutes any “existing knowledge”. In other words, inventive step is determined vis-à-vis any matter published in any document anywhere in the world or any use before the priority date of the application. Unlike

⁵SC in Novartis vs Union of India, SUPREME COURT OF INDIA Civil Appeal Nos. 2706-2716 of 2013 (Arising out of SLP (C) Nos. 20539-20549 of 2009)paragraph 89

the novelty, mosaicing of prior art documents is permissible in the context of inventive step.

- 8.4 In the case of *Biswanath Prasad Radhey Shyam vs Hindustan Metal Industries* (cited as AIR 1982 SC 1444), Hon'ble Supreme Court observed on inventive step as :

*The expression "does not involve any inventive step" used in Section 26(1) (a) of the Act and its equivalent word "obvious", have acquired special significance in the terminology of Patent Law. The 'obviousness' has to be strictly and objectively judged. For this determination several forms of the question have been suggested. The one suggested by Salmond L. J. in *Rado v. John Tye & Son Ltd.* is apposite. It is: "Whether the alleged discovery lies so much out of the Track of what was known before as not naturally to suggest itself to a person thinking on the subject, it must not be the obvious or natural suggestion of what was previously known."*

- 8.5 Another test of whether a document is a publication which would negative existence of novelty or an "inventive step" is suggested, as under: "*Had the document been placed in the hands of a competent craftsman (or engineer as distinguished from a mere artisan), endowed with the common general knowledge at the 'priority date', who was faced with the problem solved by the patentee but without knowledge of the patented invention, would he have said, "this gives me what I want?" (Encyclopaedia Britannica; ibid). To put it in another form: "Was it for practical purposes obvious to a skilled worker, in the field concerned, in the state of knowledge existing at the date of the patent to be found in the literature then available to him, that he would or should make the invention the subject of the claim concerned ?"*[Halsbury, 3rd Edn, Vol. 29, p. 42 referred to by Vimadalal J. of Bombay High Court in *Farbwrke Hoechst & B. Corporation v. Unichem Laboratories*].

- 8.6 **Skilled person:** The meaning of a person skilled in the art is extremely important in the context of inventive step analysis. This hypothetical person is presumed to know all the prior arts as on that date, even non-patent prior art in theory available to public. He has knowledge of the technical advancement as on that date, and the skill to perform experiments with the knowledge of state of the art⁶. He is not a dullard and has certain modicum of creativity⁷. The IPAB has made a distinction between the person skilled in the art (the obviousness person) and the person who has average skill (enablement man)⁸. Choosing a better alternative/substitute from the known alternative from the prior art to obtain the known results would not go beyond what may be normally expected from person skilled in the art.

- 8.7 **Hindsight analysis:** The 'obviousness' has to be strictly and objectively judged¹⁴. To judge obviousness objectively, the skilled person needs to eliminate the hindsight

⁶ Please see decision of IPAB in *Fresenius Kabi Oncology Limited vs Glaxo Group Limited*, ORA/22/2011/PT/KOL AND M.P. NO.140/2012 IN ORA/22/2011/PT/KOL, ORDER (No.161 of 2013) [Paragraph 52], quoting therein IPAB Order No.128 of 2013 in ORA/08/2009/PT/CH AND Miscellaneous Petition Nos. 7/2010, 31/2010, 51/2011, 86/2012, 142/2012 & 143/2012 in ORA/08/2009/PT/CH *Enercon (India) Limited vs. Aloys Wobben*, on the basis of Judgment of Delhi High Court in *F. Hoffmann-La Roche Ltd, vs Cipla Ltd*, CS (OS) No.89/2008 and C.C. 52/2008,

⁷ IPAB in *In Sankalp Rehabilitation Trust vs Hoffman–Roche* [OA/8/2009/PT/CH] Oder No. 250/2012]

⁸ in *Enercon, vs Aloys Wobben*, [ORA/08/2009/PT/CH] (Order No. 123 of 2013) [Paragraph 30]

analysis. The prior art needs to be judged on the date of priority of the application and not at a later date.⁹

8.8 Reasonable expectation of success: With respect to what is obvious, it must be borne in mind that the mere existence in the prior arts, of each of the elements in the invention, will not *ipso facto* mean obviousness. There must be a coherent thread leading from the prior arts to the invention, the tracing of the thread must be an act which follows obviously. This “coherent thread leading from the prior art to the obviousness” or in other words, “the reasonable expectation of success embedded in the prior art which motivates the skilled person to reach to the invention, is the most crucial determining factor in ascertaining inventive step”. Obviousness cannot be avoided simply by showing of some degree of unpredictability in the art so long as there was a reasonable probability of success¹⁰. Obviousness does not require absolute predictability of success. All that is required is a reasonable expectation of success¹⁰. In the matter of pharmaceutical inventions structural and functional similarity of the product provides this motivation to combine the teachings of the prior arts. A surprising effect, synergistic outcome of the combinations, prior art prejudice etc. usually demonstrates the non-obvious nature of the invention. However, it is reiterated that choosing a better alternative/substitute from the known alternative from the prior art to obtain the known results would not go beyond what may be normally expected from person skilled in the art. Thus, when the solution is from a limited set of alternatives which is obvious to try, even the demonstration of surprising effects etc. do not provide any answer to the obviousness. In other words enhanced effects cannot be adduced as evidence of inventive step if they emerge from obvious tests.

8.9 Method for objectively analysing the inventive step:

- a) Identify the inventive concept of the claim in question
- b) Identify the "person skilled in the art",
- c) Identify the relevant common general knowledge of the person skilled in the art at the priority date;
- d) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim;
- e) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of inventive ingenuity?

⁹ IPAB in Enercon vs Aloys Wobben [ORA/08/2009/PT/CH, Oder No. 123 of 2013] [Paragraph 43]

¹⁰ IPAB in Ajanta Pharma Limited vs Allergan Inc., ORA/20/2011/PT/KOL, ORDER (No.172 of 2013) [Paragraph 93]

8.10 Illustrative examples for assessment of inventive step:

Example 1:

Invention: Compound represented by the formula Py-B3, in which **Py** stands for a specific pyrazolone skeleton and B stands for ethyl. The compounds of the invention possess analgesic properties.

Prior Art: Closest prior art describes Py-B3, wherein B stands for methyl. The compound of the prior art was not known to possess any therapeutic activity.

Analysis:

Step 1: identifying the inventive concept embodied in the patent: the inventive concept is Py-B3, B stands for ethyl; where the compounds of invention possess analgesic properties

Step 2: Imputing to a person of ordinary skill having ordinary creativity what was common general knowledge in the art at the priority date:

This test requires two activities, namely, identifying the skilled person and the common general knowledge:

Skilled person: In this case the skilled person is a medicinal chemist or may be a composite team of an organic chemist and a pharmacologist.

Common general knowledge: The skilled person has a thorough knowledge of the state of the art related to the organic chemistry of pyrazolones and also a thorough knowledge of the state of the art of the compounds or classes of compounds having analgesic activity. The knowledge must be of the date of the priority of the patent application in question, and not later than that. That is, the person must not consider any document published subsequent to the date of priority.

Step 3: Identifying the differences if any between the matter cited and the alleged invention; the difference between the prior art and the invention is the replacement of three methyl substituents at the annular positions and the pharmaceutical activity of the resultant compound.

Step 4: deciding whether those differences, viewed without any knowledge of the alleged invention constituted steps which would have been obvious to the skilled man or whether they required any degree of invention: (or whether there was reasonable expectation of success or coherent thread leading from the prior art)

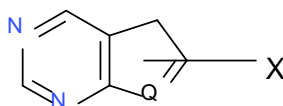
The prior art compound, although structurally very close, does not provide any clue to the skilled person that the resultant compounds with a very nominal change would be successful as a pharmaceutical product. Changing from methyl to ethyl would have been obvious to the skilled person but the said change would not suggest achieving any pharmacological property of the modified compound. In other words there was no coherent thread leading from the prior art to arrive to the invention. Alternatively, it may be said that there was no prior art motivation.

Conclusion: The invention is therefore non-obvious.

Example 2

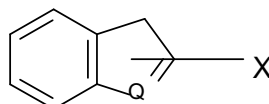
Invention: Selective COX-II inhibitor NSAIDs represented by the formula Hy-X. Hy represents a complex heterocyclic structure, whereas X represents substituents.

Background: Cyclooxygenase I and II play vital roles in pharmacological activities of NSAIDS. Early NSAIDS are known to cause gastric irritations and life threatening ulcers. Selective COX II inhibitors, developed later, are shown to inhibit gastric secretions and thereby proved to be a better choice as NSAID. The object of the invention is to provide a class of COX II inhibitors.

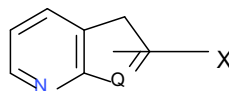


Q stands for S and O

Prior Art: D1 teaches compounds with following structures:



D2 teaches compounds with following structures:



Both the compounds of D1 and D2 are non-steroidal anti-inflammatory drugs and have disadvantage of gastric acid secretions. D2 is known to display higher level of gastric acid secretion as compared to D1.

Analysis:

Step 1: Identifying the inventive concept embodied in the patent: the inventive concept is the replacement of an annular C atom in the left hand aromatic ring with the resultant finding of a class of selective COX II inhibitor with analgesic properties.

Step 2: Imputing to a person of ordinary skill having ordinary creativity what was common general knowledge in the art at the priority date:

Skilled person: In this case the skilled person is a medicinal chemist or may be a composite team of an organic chemist and a pharmacologist.

Common general knowledge: The skilled person has a thorough knowledge of the state of the art related to the organic chemistry of heterocyclic compounds and also a thorough knowledge of the state of the art of the compounds or classes of compounds having analgesic activity. The knowledge must be of the date of the priority of the

patent application in question, and not later than that. That is, the person must not consider any document published subsequent to the date of priority.

Step 3: Identifying the differences if any between the matter cited and the alleged invention; the difference between the prior art and the invention is the replacement of C atom at the annular position as said above and the pharmaceutical activity of the resultant compound.

Step 4: deciding whether those differences, viewed without any knowledge of the alleged invention constituted steps which would have been obvious to the skilled man or whether they required any degree of invention: (or whether there was reasonable expectation of success or coherent thread leading from the prior art)

In the instant case, the invention required two successive changes in the annular positions if viewed from D1. However, after reaching to D2 and after finding that the resultant compound does not display any selective COX II inhibiting properties, the skilled person would not feel motivated to make any further change in D2 to reach to the compound of the present invention. In other language the prior art teaches away from the invention.

Conclusion: The invention is therefore non-obvious.

Example 3

Invention: Besylate salt of a compound A (A-B) with blood pressure lowering properties.

Background: Conversion of A-M to A-B significantly improves the processability in the manufacturing of the drug, and improves its stability, while the pharmacological property of A-B remains same as that of A-M.

Prior Art:

D1: The closest prior art D1 teaches Maleate (A-M) salt of compound A having same physiological properties.

D2: D2 shows a list of 53 pharmacologically acceptable anions as salt forming candidates from the list of drug approval authorities. However, the most commonly used anion is hydrochloride, whereas besylate is used for 0.25% of the approved drugs. Other than hydrochloride, which was used in approximately 43% of approved drugs, almost all other salts could be categorized as "seldom used." 40 out of 53 anions were used in less than 1% of drugs and 23 out of 53 were used in 0.25% or less of drugs.

D3: Prior art D3 shows that besylate salts impart excellent stability and other properties.

Analysis:

Step 1: Identifying the inventive concept embodied in the patent: besylate salt of a compound A with better processability.

Step 2: Imputing to a person of ordinary skill having ordinary creativity what was common general knowledge in the art at the priority date:

Skilled person and common general knowledge: the skilled person is either a medicinal chemist or a composite team comprising a medicinal chemist and a pharmacologist. The skilled person has a common general knowledge, has a thorough understanding of processability of drugs. He is capable of undertaking experiments within a limited area and is capable of choosing a better alternative/substitute from the known alternative from the prior art to obtain the known results. He is aware of both D1, D2 and D3.

Step 3: Identifying the differences if any between the matter cited and the alleged invention; the difference is the replacement of maleate anion with besylate anion as salt forming agent.

Step 4: deciding whether those differences, viewed without any knowledge of the alleged invention constituted steps which would have been obvious to the skilled man or whether they required any degree of invention: In the present case, the person skilled in the art had to try from a list of 53 anions. He would not have been dissuaded by the fact that besylate is used for 0.25% of the approved drugs as he had knowledge that other anions were also used rarely. Rather D3 would have motivated him to undertake the trials from within this set of 53 anions particularly keeping in view the better properties of the besylate salts. Considering that the besylate salts would have been obvious to try and having reasonable expectation of success he would go for such alterations.

Conclusion: The invention is therefore obvious.

The inventive step in the subsequent examples has been analysed by following the steps as prescribed above.

Example 4:

The claimed invention relates to a process for the preparation of Compound C by treating Compound A and Compound B in the presence of platinum catalyst. All the features of the invention are disclosed in the prior art except the platinum as a catalyst explicitly, but it was mentioned as noble metal catalysts.

Analysis: Prior art generically disclosed platinum as noble element which is also an equivalent element used in the art for similar purposes and obvious to the skilled person. Therefore, it is application of known feature in the prior art into claimed invention in an obvious way.

Example 5:

The claimed invention relates to monoester of a known diol compound for treating cancer diseases using amino acids selected from lysine, valine, leucine and the like, as an esterifying agent. Due to poor oral bioavailability, the diol was unable to use as oral delivery system. To improve the oral bioavailability one of the hydroxyl group in the diol was converted into a monoester using said amino acids.

Prior art disclosed monoalcohol with similar structure having poor oral bioavailability was converted into an ester using amino acids selected from lysine, valine, leucine and the like, as an esterifying agent, which exhibit improved oral bioavailability in the treatment of cancer diseases. Amino acid used in the prior art as well as in the claimed invention is lysine.

Prior Art	Claimed Invention
$R-CH_2-OH$ ↓ $R-CH_2-OR'$ R' is lysine, valine, leucine and the like	$HO-CH_2-R-CH_2-OH$ ↓ $HO-CH_2-R-CH_2-OR'$ R' is lysine, valine, leucine and the like

Analysis: Object of the claimed invention was to provide a solution to overcome the poor oral bioavailability of diol, when administered as oral delivery system. One of the alcohol groups in the diol was converted into ester using lysine for improving the oral bioavailability of the diol.

Prior art addressed poor oral bioavailability for substantially similar structure of monoalcohol. The problem was solved by converting the monoalcohol into ester using lysine as an esterifying agent. Therefore a person skilled in the art can be motivated with teachings of the prior art to use the amino acid for improving the oral bioavailability by converting diol into monoester ester of diol to solve similar kind of problem. Therefore there is no technical advancement involved in the claimed invention.

Example 6:

The claimed invention relates to a branched polyethylene glycol-interferon conjugate for treating cancer. Interferons are antiviral biological drugs, which is also used in the treatment of cancer. PEGylation technique is known in the art to improve the activity of protein, more particularly proteins attached to the linear or branched conjugates of Polyethylene glycol(PEG) increase the activity of the protein certain extent. Method of preparing branched pegylated lysine and activating carboxyl group in the lysine using N-hydroxysuccinimide to further substitute any suitable substance into the carboxyl group for improving the activity of such substance is known from Prior art 1. Prior art 2 disclosed preparation of branched pegylated lysine substituted with enzymes such as ribonuclease, catalase, asparaginase, trypsin etc. Branched pegylated protein conjugates are shown greater activity and stability than the linear mPEG.

Prior Art 1	Prior Art 2	Claimed Invention
<p>A $(m\text{PEG})_2 > \text{R-COOR}'$ is αlysine; R' is methyl, ethyl, propyl and the like</p>	<p>$(m\text{PEG})_2 > \text{R-CO-NH-}$ Protein R is lysine; protein is enzyme such as ribonuclease, catalase, asparaginase, trypsin etc</p>	<p>$(m\text{PEG})_2 > \text{R-CO-NH-Interferon}$ R is lysine</p>

Prior arts 1 & 2 disclosed method for the preparation of branched pegylated protein conjugates said method involves linking mono-methyl poly-ethyleneglycol one each onto ϵ and α amino group of lysine and carboxyl group of lysine substituted with protein. Branched pegylated protein conjugates have shown improved effect compared with the linear protein conjugates. The person skilled in the art can be motivated with teachings disclosed in the prior arts and common general knowledge in the art at that time of filing the claimed invention can be motivated to prepare branched pegylated conjugate with α -interferon for better therapeutic effect as suggested in Prior art 2. Substituting α -interferon in lieu of proteins onto the position as suggested in D1 & D2 and improvement in the activity of branched pegylated interferon conjugate cannot be considered as technical advancement over the prior art.

Example 7:

A pharmaceutical composition comprising first active agent in an amount from about 2 mg to about 4 mg corresponding to a daily dosage and second active agent in an amount from about 0.01 mg to about 0.05 mg corresponding to a daily dosage together with one or more pharmaceutically acceptable carriers or excipients. The composition consists of a number of separately packaged and individually removable daily dosage units placed in a packaging unit and intended for oral administration for a period of at least 21 consecutive days. The first active agent present in the composition is in micronized form or sprayed from a solution onto particles of an inert carrier.

D1: The first and second active agents together with combination of those agents are known in the art. D2: Micronisation for poorly soluble similar drugs is also known in the art for improved drug delivery.

Analysis: Micronized form of first active agent is novel aspect in the present composition. Dose and dosage regimen of first and second active agents in combination and micronisation for poorly soluble similar type of drugs are known in the art. Therefore, it is obvious to a person skilled in the art to convert poorly soluble

active ingredient into micronized form for improved drug delivery. Further, changing the particle size is mere modification in the physical form of the active agent for improved and anticipated effect and therefore the claimed invention is obvious.

9. Industrial applicability

As per Section 2(1)(ac) of the Act, the expression “capable of industrial application”, in relation to an invention, means that the invention is capable of being made or used in an industry”. Further, Section 64 (1) (g) of the Act provides that a patent is liable to be revoked if the invention is not useful. To be patentable an invention must be useful and capable of industrial application. The specification should disclose the usefulness and industrial applicability of an invention in a distinct and credible manner unless the usefulness and industrial applicability of the invention is already established, either in explicit or in implicit manner. In other words, the requirement of workability and usefulness are both connected to the requirement of industrial applicability. If an invention is not workable, it means that it is also not industrially applicable. The patent specification must disclose a practical application and industrial use for the claimed invention wherein a concrete benefit must be derivable directly from the description coupled with common general knowledge. Mere speculative use or vague and speculative indication of possible objective will not suffice.

9.1 Illustrative examples for industrial applicability:

Example 1:

Invention: Synthetic analogues of a steroid. The steroids possess certain medicinal properties. However, the compounds of the invention, as asserted, are subjects of serious investigation, being the analogue of compounds known for medicinal properties.

Analysis: The claimed compounds are not patentable as they lack any credible and specific utility. A mere scientific interest does not make something eligible for patentability.

Example 2:

Invention: The application comprises three sets of claims:

1. A compound of formula A
2. A compound of formula B
3. A process of making A and B, wherein, C and D are reacted at m to n degree centigrade, in an aprotic solvent Y, the said aprotic solvent being selected from a,b,c,d,e and subsequently distilled and purified to isolate A from B

The specification describes the use of compound of formula A as having certain pharmaceutical applications. However, the specification does not disclose any use of the compound of formula B.

Analysis: Claim 2 is not allowable in so far that the compound is not shown to possess any utility. Just because it is a by-product of a reaction for the preparation of the compound of formula A, does not make it a patentable subject matter.

10. Inventions not patentable:

10.1 **Section 3 (b):** Inventions contrary to morality or which cause serious prejudice to human, animal or plant life or health or environment are not patentable. Any invention, the primary or intended use or commercial exploitation of which is against the public order or morality or is capable of causing serious damage to the human, animal or plant life or cause damage to the environment or public health is not allowable under this section. Since an invention is a reward to the owner of an invention in the form of monopoly, such rewards are not justified from the public policy angle, if they are prejudicial to the public interest.

10.2 **Section 3(c):** Scientific principles or abstract theory or discovery of living things or non-living substances are not patentable inventions. Section 3 (c) of the Act, excludes the mere discovery of a scientific principle or the formulation of an abstract theory or discovery of any living thing or non-living substance occurring in nature from the scope of patentability. Compounds which are isolated from nature are not patentable subject-matter. However, processes of isolation of these compounds can be considered subject to requirements of Section 2 (1) (j) of the Act.

10.3 Illustrative examples for section 3(c):

Example 1:

Claim: A compound for cardiac disorder related activity, wherein the compound is obtained from the cerebrospinal fluid of horseshoe crab, *Tachypleus gigas*.

Analysis: The subject-matter is not patentable under Section 3 (c) of the Act, because the application attempts to claim a compound, which is isolated from cerebrospinal fluid of embryos of horseshoe crab, *Tachypleus gigas* (i.e. a compound which is non-living substance occurring in nature). As per Section 3 (c) of the Act, a non-living substance occurring in nature is statutorily non-patentable subject-matter.

Example 2:

Invention: An extract of *Calotrophis gigantea* containing cardiac glycosides having antineoplastic effect, which exhibit *in vitro* cytotoxic activity on human carcinoma cell line without exhibiting cytotoxicity on a normal human cell line, wherein the extract is effective against human lung carcinoma cell line A549 and human colon adenocarcinoma cell line COL0205 without showing cytotoxicity on a normal human cell line W138.

Analysis: The claimed extract of *C. gigantea* containing cardiac glycosides is statutorily excluded from patentability under Section 3 (c) of the Act, as being directed to a discovery of non-living substance occurring in nature.

- 10.4 **Section 3(d)** :The mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus is not a patentable invention unless such known process results in a new product or employs at least one new reactant.

Explanation:- For the purposes of this clause, salts, esters, ethers, polymorphs, metabolites, pure form, particle size, isomers, mixtures of isomers, complexes, combinations and other derivatives of known substance shall be considered to be the same substance, unless they differ significantly in properties with regard to efficacy.

- 10.5 In the context of the pharmaceutical inventions, Section 3(d) deserves special attention. Section 3(d) stipulates that an incremental invention, based upon an already known substance, having established medicinal activity shall be deemed to be treated as a same substance, and shall fall foul of patentability, if the invention in question fails to demonstrate significantly improved therapeutic efficacy with respect to that known compound. After analysing the legislative history of Section 3(d), the Hon'ble Supreme Court commented, "We have, therefore, no doubt that the amendment/addition made in section 3(d) is meant especially to deal with chemical substances, and more particularly pharmaceutical products. The amended portion of section 3(d) clearly sets up a second tier of qualifying standards for chemical substances/pharmaceutical products in order to leave the door open for true and genuine inventions but, at the same time, to check any attempt at repetitive patenting or extension of the patent term on spurious grounds"¹¹. [Novartis AG Vs. Union of India (UOI) and Ors, MANU/SC/0281/2013, Paragraph 103].

- 10.6 While interpreting what is "efficacy", the Hon'ble Supreme Court held that in the context of the pharmaceutical patenting the "efficacy" should be understood as "therapeutic efficacy".¹² While dealing with the explanation as provided in Section 3(d) it must also be kept in mind that each of the different forms mentioned in the explanation have some properties inherent to that form, e.g., solubility to a salt and hygroscopicity to a polymorph. These forms, unless they differ significantly in property with regard to "therapeutic efficacy", are expressly excluded from patentability. Hence, the mere change of form with properties inherent to that form would not qualify as "enhancement of efficacy" of a known substance. In other words, the explanation is meant to indicate what is not to be considered as therapeutic efficacy¹³.

¹¹SC in Novartis AG Vs. Union of India (UOI) and Ors, *op.cit*, Paragraph 103

¹²"Efficacy means "the ability to produce a desired or intended result". Hence, the test of efficacy in the context of section 3(d) would be different, depending upon the result the product under consideration is desired or intended to produce. In other words, the test of efficacy would depend upon the function, utility or the purpose of the product under consideration. Therefore, in the case of a medicine that claims to cure a disease, the test of efficacy can only be "therapeutic efficacy". [*ibid*, Paragraph 180]

¹³*ibid*, paragraph 181

- 10.7 Also, the Supreme Court explained what would mean a “new product” in the context of Section 3(d): “.....the new product in chemicals and especially pharmaceuticals may not necessarily mean something altogether new or completely unfamiliar or strange or not existing before. It may mean something “different from a recent previous” or “one regarded as better than what went before” or “in addition to another or others of the same kind”. However, in case of chemicals and especially pharmaceuticals if the product for which patent protection is claimed is a new form of a known substance with known efficacy, then the subject product must pass, in addition to clauses (j) and (ja) of section 2(1), the test of enhanced efficacy as provided in section 3(d) read with its explanation”¹⁴.
- 10.8 According to the Supreme Court, whether or not an increase in bioavailability leads to an enhancement of therapeutic efficacy in any given case must be specifically claimed and established by research data¹⁵.
- 10.9 However, it is important to note that Supreme Court has clarified further that the test of Section 3(d) of the Act does not bar patent protection for all incremental inventions of chemical and pharmaceutical substances¹⁶.
- 10.10 The term “combination” as appearing in Section 3(d) has been explained by IPAB as “The combination mentioned in the Explanation can only mean a combination of two or more of the derivatives mentioned in the Explanation or combination of one or more of the derivatives with the known substance which may result in a significant difference with regard to the efficacy”¹⁷.

10.11 Illustrative examples for section 3(d):

Example 1:

The invention relates to a β -crystalline form of methanesulfonic acid addition salt of imatinib and processes for the preparation thereof. The application was filed with the title: Crystal Modification of A N-phenyl-2-pyrimidineamine Derivative, Processes for Its Manufacture And Its Use. The substance claimed was a *medicine for the treatment of* chronic myeloid leukemia (CML).

The specification asserts that the claimed β -form has (i) more beneficial flow properties; (ii) better thermodynamic stability; and (iii) lower hygroscopicity than the alpha crystal form of ImatinibMesylate. No experimental data related to efficacy is provided in the specification for β -crystalline form imatinibmesylate or imatinibmesylate.

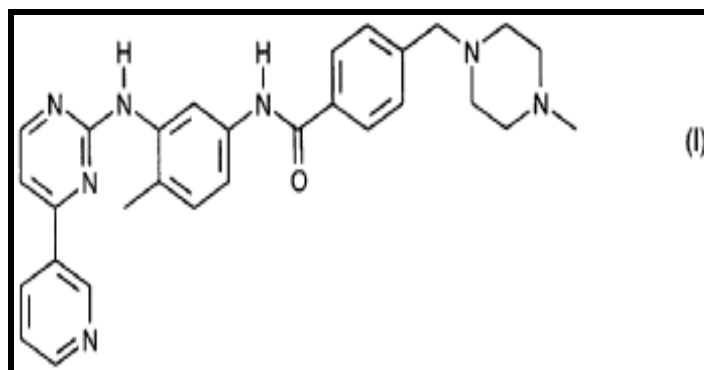
Claims: A form of the methanesulfonic acid addition salt of a compound of formula comprising crystals of the β -modification.

¹⁴ *Ibid*, paragraph 192

¹⁵ *Ibid*[Paragraph 189]

¹⁶ “We have held that the subject product,does not qualify the test of Section 3(d) of the Act but that is not to say that Section 3(d) bars patent protection for all incremental inventions of chemical and pharmaceutical substances. It will be a grave mistake to read this judgment to mean that section 3(d) was amended with the intent to undo the fundamental change brought in the patent regime by deletion of section 5 from the Parent Act. That is not said in this judgment”. [*Ibid*, Paragraph 191].

¹⁷ AjanthaPharma Limited Vs Allergan Inc. and Others,ORA/21/2011/PT/KOL of Order no. 173 of 2013, Paragraph 84



A number of pre-grant oppositions were filed. The application for patent was refused under Section 25(1) on the ground that the invention was

- anticipated by US Patent no: 5521184 (Zimmerman Patent, disclosing Imatinib and salts), "Nature Medicine' of May 1996, and the Patent term extension certificate for the 1993 patent issued by the USPTO which specifically mentions imatinibmesylate as the product;
- obvious vis-à-vis US 5521184
- not allowable u/s 3(d): Applicant fails to prove enhanced efficacy (thirty percent bioavailability was held not meeting the requirement of “therapeutic efficacy”).

Decision of Supreme Court: After several rounds of litigations in different forums, the matter reached before the Supreme Court.

It was argued on behalf of the appellant that

There is certainly no mention of polymorphism or crystalline structure in the Zimmermann patent. The relevant crystalline form of the salt that was synthesized needed to be invented. There was no way of predicting that the beta crystalline form of Imatinib Mesylate would possess the characteristics that would make it orally administrable to humans without going through the inventive steps.

It was further argued that the Zimmermann patent only described, at most, how to prepare Imatinib free base, and that this free base would have anti-tumour properties with respect to the BCR ABLkinase.

Thus, arriving at the beta-crystalline form of Imatinib Mesylate for a viable treatment of Chronic Myeloid Leukemia required further invention – not one but two, starting from Imatinib in free base form, (formation of mesylate and then beta crystalline thereof).

The Court mainly focussed its analysis on (1) whether imatinib mesylate was already known, and then (2) if it is a known substance, it must meet the criteria of enhanced efficacy as in Section 3(d).

The Court after analysing the documents held that, “Imatinib Mesylate is all there in the Zimmermann patent. It is a known substance from the Zimmermann patent”¹⁸.

¹⁸*ibid*, [paragraph 131]

After finding that Imatinib Mesylate is a known substance from the Zimmermann patent itself.....its pharmacological properties are also known in the Zimmermann patent and in the article published in the Cancer Research journal (Cancer Research, January 1996)¹⁹. “The subject product, that is beta crystalline form of Imatinib Mesylate, is thus clearly a new form of a known substance, i.e., Imatinib Mesylate, of which the efficacy was well known. It, therefore, fully attracts section 3(d) and must be shown to satisfy the substantive provision and the explanation appended to it”²⁰. “It is noted, in the earlier part of judgment, that the patent application submitted by the appellant contains a clear and unambiguous averment that all the therapeutic qualities of beta crystalline form of Imatinib Mesylate are also possessed by Imatinib in free base.....”[Paragraph 162]

“..the appellant was obliged to show the enhanced efficacy of the beta crystalline form of Imatinib Mesylate over Imatinib Mesylate (non-crystalline). There is, however, no material in the subject application or in the supporting affidavits to make any comparison of efficacy, or even solubility, between the beta crystalline form of Imatinib Mesylate and Imatinib Mesylate” (non-crystalline). [Paragraph 171]

On the question of bio-availability the Court held that “.....the position that emerges is that just increased bioavailability alone may not necessarily lead to an enhancement of therapeutic efficacy”. In this case, there is absolutely nothing on this score apart from the adroit submissions of the counsel. No material has been offered to indicate that the beta crystalline form of Imatinib Mesylate will produce an enhanced or superior efficacy (therapeutic) on molecular basis than what could be achieved with Imatinib free base in vivo animal model”²¹.

The Court, therefore rejected the appeal.

Example 2 :

In yet another case, No.162 of 2013 in Fresenius Kabi Oncology Limited vs . Glaxo Group Limited, the IPAB determined the issue of Section 3(d).

Claimed compound: A quinazoline derivative having anticancer activity.

Prior Arts: two prior arts were cited by opponent. The respondent admitted the prior arts, but argued that the compound as claimed was a new chemical entity.

Decision of IPAB²²: While rejecting the argument of Section 3(d) IPAB held that “It is true that it is the patentee who must prove the enhanced therapeutic efficacy of his invention. But in a revocation the applicant must plead and prove that it is hit by S.3(d) and that it has the same therapeutic efficacy as the known substance. Then the respondent will counter it either by proving that it is not a derivative of a known substance or by proving that though it is only a new form of a known substance he has shown that it has enhanced therapeutic efficacy. In the present case, there are no such pleadings. It is not enough to plead that because Ex1 and 2 are admitted

¹⁹ *ibid*, [paragraph 157].

²⁰ *ibid*[Paragraph 161]

²¹ *ibid* [Paragraph 189].

²² Fresenius Kabi Oncology Limited vs .Glaxo Group Limited ORA/17/2012/PT/KOL, Order No.162 of 2013, paragraph 56.

prior arts, this is only a new form of those compounds. That is vague. It is only when the pleadings show how the invention is one kind of a derivative of known substance the patentee will have to explain how the grant of patent is justified because of the enhancement of therapeutic efficacy. In this case the pleadings are not adequate. We hold that the S.3(d) ground has not been proved”.

10.12 Section 3 (e): Mere Admixture Resulting Only In Aggregation Of The Properties Or A Method Of Making Such Mere Admixture

10.13 It is a well-accepted principle of Patent Law that mere placing side by side of old integers so that each performs its own proper function independently of any of the others is not a patentable combination, but that where the old integers when placed together has some working interrelation producing a new or improved result, then there is patentable subject matter in the idea of the working inter relations brought about by the collocation of the integers.

10.14 In *Ram Pratap v Bhaba Atomic Research Centre* (1976) IPLR 28 at 35, it was held that a mere juxtaposition of features already known before the priority date which have been arbitrarily chosen from among a number of different combinations which could be chosen was not a patentable invention.

10.15 Section 3(e) of the Act reflects the legislative intent on the law of patenting of combination inventions in the field of chemical as well as biotechnological sciences.

10.16 Claims related to compositions obtained by mere admixture resulting in aggregation of the properties of the individual components are not patentable under section 3(e) of Act.

10.17 : Illustrative examples for section 3(e):

Example 1:

Claim: A composition of Paracetamol (Antipyretic) and Ibuprofen (analgesic)] to control pain and inflammation.

Analysis: The compounds used in the alleged invention are known for their activity. The application is silent on a combinative effect of these two compounds over the sum of their individual effects. Thus, the claimed subject-matter is non-patentable under Section 3 (e) of the Act.

Example 2:

Invention : A pharmaceutical composition exhibiting anti-phlogistic, antipyretic and analgesic activity and high gastro-enteric tolerance in unit doses form which contained imidazole salicylate as the active ingredient in the amount of 100-600 mg and an inert carrier was claimed .

Analysis:It was held by the Controller that the active compound such as imidazole salicylate was known in the art and applicant could not develop any special property or even improve upon the property of the compound to be mixed up with the usual carrier to form the composition.

10.18 Section 3 (i): Method Of Treatment

10.19 According to Section 3 (i) of the Act, any process for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products is not an invention. Under this section, the Manual of Patent Office Practice & Procedure states that the followings are excluded from patentability:

(a) Medicinal methods: As for example, a process of administering medicines orally, or through injectables, or topically or through a dermal patch;

(b) Surgical methods: As for example, a stitch-free incision for cataract removal;

(c) Curative methods: As for example, a method of cleaning plaque from teeth;

(d) Prophylactic methods: As for example, a method of vaccination;

(e) Diagnostic methods: Diagnosis is the identification of the nature of a medical illness, usually by investigating its history and symptoms and by applying tests. Determination of the general physical state of an individual (e.g. a fitness test) is considered to be diagnostic;

(f) Therapeutic methods: The term “therapy” includes prevention as well as treatment or cure of disease. Therefore, the process relating to therapy may be considered as a method of treatment and as such not patentable;

(g) Any method of treatment of animal to render them free of disease or to increase their economic value or that of their products. As for example, a method of treating sheep for increasing wool yield or a method of artificially inducing the body mass of poultry;

(h) Further examples of subject matters excluded under this provision are: any operation on the body, which requires the skill and knowledge of a surgeon and includes treatments such as cosmetic treatment, the termination of pregnancy, castration, sterilization, artificial insemination, embryo transplants, treatments for experimental and research purposes and the removal of organs, skin or bone marrow from a living donor, any therapy or diagnosis practiced on the human or animal body and further includes methods of abortion, induction of labour, control of estrus or menstrual regulation;

(i) Application of substances to the body for purely cosmetic purposes is not therapy;

(j) Patent may however be obtained for surgical, therapeutic or diagnostic instrument or apparatus. Also the manufacture of prostheses or artificial limbs and taking measurements thereof on the human body are patentable.

10.20 In the field of pharmaceuticals, it is noticed that method of treatments are often claimed in the guise of composition claims. Sometimes, such claims are converted to product claims during examination procedure. Such amendments shall be examined as per Section 57 read with section 59 of the Act.

10.21 ILLUSTRATIVE EXAMPLE:

Claim 1: A method of treating cancer in a subject, the said method comprising administering simultaneously or sequentially a combination of Gemcitabine and P276-00 or the combination of Gemcitabine and P1446A, wherein the said cancer is selected from a group comprising of pancreatic cancer, lung cancer, colorectal carcinoma and head and neck cancer.

Analysis: The claimed subject-matter falls within the scope of statutorily non-patentable inventions under Section 3 (i) of the Act, as being directed to a method of treatment of human beings or animals.

10.22 **Section 3(j) and 3(p):** To avoid unnecessary repetition, relevant sections of the “GUIDELINES FOR EXAMINATION OF BIOTECHNOLOGY APPLICATIONS” and “GUIDELINES FOR PROCESSING OF PATENT APPLICATIONS RELATING TO TRADITIONAL KNOWLEDGE AND BIOLOGICAL MATERIAL” are hereby incorporated by reference.

10.23 According to Section 3(j), plants or animals including its parts like seeds etc. are not patentable subject matter. The only exception to this rule is micro-organisms. From the conjoint reading of Section 3(c) and 3(j), the micro-organisms, which occur in nature are not patentable subject matter. Accordingly, only genetically modified micro-organisms qualify for patentability. In the GUIDELINES FOR EXAMINATION OF BIOTECHNOLOGY APPLICATIONS FOR PATENT, Section 3(j) has been discussed with specific examples. According to Section 3(p) of the Act, an invention which, in effect, is a traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components is not a patentable subject matter. “GUIDELINES FOR PROCESSING OF PATENT APPLICATIONS RELATING TO TRADITIONAL KNOWLEDGE AND BIOLOGICAL MATERIAL” already issued by the Office discusses in details, the manner in which cases related to traditional knowledge may be handled. However, in the following, an example related to Section 3(p) is given:

10.24 Illustrative Example for Section 3(j):

Claim 1: A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide comprising at least an immunogenic portion of a breast tumor protein, or a variant thereof in combination with a pharmaceutically acceptable carrier or excipient, wherein the antigen presenting cell is a dendritic cell or a macrophage.

Analysis: Although claim 1 is directed to a pharmaceutical composition, it should be objected under Section 3 (j) of the Act, since the composition essentially contain an antigen-presenting cell as an active ingredient and carriers or excipients are obvious features with the cell while in the composition.

10.25 Illustrative Example for Section 3(p):

Claim: A method of treating an inflammatory bowel disease (IBD) in a subject in need thereof, comprising administering to the subject an effective amount of an extract of *Andrographis paniculata*, wherein said extract contains andrographolide, 14-deoxy-

andrographolide, 14-deoxy-11, 12-dehydrogen-andrographolide and neoandrographolide.

Analysis: The claimed subject-matter falls within the scope of statutorily non-patentable inventions under Section 3 (p) of the Act, as being directed a traditional knowledge in effect. This is clearly evident from an article published in the Journal of Natural Medicine (Kakrani et al., "Traditional treatment of gastro-intestinal tract disorders in Kutch District, Gujarat State, India", Journal of Natural Medicine, Vol. 2/1(2002), pages 71-75). The cited article describes traditionally known treatments of gastro-intestinal tract disorders in Kutch district of Gujarat. In this article, 41 species of 37 genera belonging to 22 families are reported along with plant parts used for the medicinal treatments, including *Andrographispaniculata* and its medical indication. Thus, the claimed subject-matter, in effect, is traditional knowledge and non-patentable under Section 3 (p).

11. Sufficiency of description, clarity and support of the claims:

- 11.1 According to Section 10 (4) (a) and (b) of the Act, the complete specification shall fully and particularly describe the invention and its operation or use and the method by which it is to be performed and it should also disclose the best method of performing the invention which is known to the applicant and for which he is entitled to claim protection. As per Section 10(c), every complete specification should end with a claim or a set of claims defining the scope of invention. Section 10(5) prescribes that the claims should be clear, succinct and fairly based on the description. Also, the claims must relate to a group of inventions linked so as to form a single inventive concept. For convenience, unity of invention has been discussed below, under separate head.
- 11.2 Sufficiency of micro-organisms and deposits: If the invention relates to a biological material which is not possible to be described in a sufficient manner and which is not available to the public, the application shall be completed by depositing the material to an International Depository Authority (IDA) under the Budapest Treaty. The deposit of the material shall be made not later than the date of filing of the application in India and a reference of the deposit shall be given in the specification within three months from the date of filing of the patent application in India. All the available characteristics of the material required for it to be correctly identified or indicated are to be included in the specification including the name, address of the depository institute and the date and number of the deposit.
- 11.3 In Para 17 of "GUIDELINES FOR PROCESSING OF PATENT APPLICATIONS RELATING TO TRADITIONAL KNOWLEDGE AND BIOLOGICAL MATERIAL", it is directed that "if the source and geographical origin of the biological material used in the invention is not disclosed in the specification, an objection shall be raised thereof in conformity with section 10 (4) (a)& (b) of the Patents Act." Therefore, the same is incorporated herein by reference and also, applicable in the present guidelines. Thus, while accessing the sufficiency of disclosure, non-disclosure of the source and geographical origin of the biological materials used in the invention would be treated as insufficiency of disclosure as per the requirement of Section 10 (4) (ii) (D) of the Act. Nevertheless, in

Para 20 of above said guidelines, it also directed that “On the other hand, if the declaration in Form-1 regarding the use of biological material from India is cancelled out by the applicant and the specification also states that the source and geographical origin of the biological material is not from India, the specification should be amended by way of incorporation of a separate heading/paragraph at the beginning of the description that the biological material used in the invention is not from India and should clearly specify the country of source and geographical origin of the same.” Therefore, while processing the patent application in which the above declaration is cancelled out by the Applicant, as directed, necessary amendment shall be sought for.

- 11.4 When claims seek to protect things that are not identified by the applicant at the time of filing the application, but that may be identified in the future by carrying out the applicant’s process, such claims are not patentable on the ground of insufficiency of description “e.g., claiming many compounds without proper support in the examples. The complete specification must describe “an embodiment” of the invention claimed in each of the claims and the description must be sufficient to enable those in the industry concerned to carry it into effect without their making further inventions and the description must be fair, i.e. it must not be unnecessarily difficult to follow.”²³
- 11.5 Sufficient disclosure of the invention in the patent specification is the consideration for which a patent is granted. While assessing the sufficiency of disclosure, it must be ensured that the best method for performing the invention is described so that the whole subject-matter that is claimed in the claims, and not only a part of it, must be capable of being carried out by a skilled person in the relevant art without the burden of an undue amount of experimentation or application of inventive ingenuity.
- 11.6 It may be noted that the IPAB has distinguished the person skilled in the art involved in assessing “Inventive step” and “Enablement”. In one case (please see the discussion under Inventive Step) the IPAB observed: The Act makes a distinction between the person skilled in the art (the obviousness person) and the person who has average skill (enablement man)”²⁴. In the opinion of the IPAB, in the context of enablement, the person to whom the complete specifications are addressed is a person “who has average skill and average knowledge.” The description in the specification should contain at least one example or more than one examples, covering the full breadth of the invention as claimed, which enable(s) the person skilled in the art to carry out the invention. If the invention is related to product per se, description shall be supported with examples for all the compounds claimed or at least all the genus of the compounds claimed. Method for preparation and experimental data relating to properties of each compound claimed shall be incorporated in the description, which

²³ Raj Praksh v Mangatram Chowdhury (AIR 1978 Del 1 at 9) following Farbwerke Hoechst Aktiengesellschaft Vormalis Meister Lucius & Bruning a Corporation etc. Vs. Unichem Laboratories and Ors”. (AIR1969Bom255)

²⁴ Enercon, vs Aloys Wobben ORDER No. 123 of 2013. “...In fact it is clear that in the context of enablement, the person to whom the complete specifications are addressed is a person “who has average skill and average knowledge.” Neither of these attributes has been assigned by the Act to the person to whom the invention should be non-obvious. We are not called upon in this case to decide the person who is enabled. We are only pointing out to the difference in the words used in the Act. We do not intend to visualize a person who has super skills, but we do not think we should make this person skilled in the art to be incapable of carrying out anything but basic instructions. The Act makes a distinction between the person skilled in the art (the obviousness person) and the person who has average skill (enablement man)”. [Paragraph 30].

enable a person having ordinary skilled in the art can make use of the invention without undue burden.

- 11.7 Non-technical terms, like trademarks etc. should be discouraged and the applicant should be asked to replace them with equivalent technical terms.
- 11.8 An insufficient complete specification cannot become sufficient because of general developments in the state of the art after the filing date. The relevant date for complying with the requirement for sufficiency is the date of complete specification. In other words, a complete specification should provide enough information to allow a person skilled in the art to carry out all that which falls within the ambit of what is claimed. Specific and substantial use of the invention along with any test conducted and results obtained for such an effect shall be disclosed at that time of filing. In case, application claims substance, composition or combination, detailed report pertaining to the test, such as in vitro or in vivo, conducted and experimental results with inference of such a test shall be provided in the description. Test parameters, choice of testing method, mode of drug delivery, results obtained with explanation and inference shall be provided. Test conducted and data provided can be predictive in humans and should be accepted by the skilled person. If more than one genus or pharmacological use claimed in an application, relevant test for each genus or pharmacological use shall be incorporated in the description.
- 11.9 It is not necessary to describe in the claims to a specification, processes by which a new chemical compound is discovered, when they are part of the common knowledge available to those skilled in the science who can, after reading them, refer to the technical literature on the subject for the purpose of carrying them into effect²⁵.
- 11.10 While examining the claims with respect to clarity and support as required under section 10 (5) of the Act, due consideration should be given to the provisions of section 10 (4) (a) and (b) as these requirements are complementary to each other.
- 11.11 Clarity and support of claims: As mentioned in connection with the type of claims, it was mentioned that in the pharmaceutical applications, claims are often filed as "Use of...". Such wordings in the claims are not permissible in that a claim should relate either to a product or to a process.
- 11.12 A claim may be lacking in support, if it is not fairly based on the description. In pharmaceutical fields, claims are frequently drafted in non-definitive terms and the scope of claim is often unreasonably broader than the description and enablement of the specification. Claims may embrace non-definitive terms like "comprising", "including", etc. to indicate certain essential components of the invention. Similarly terms like "near to", "approximately" may lead to confusion about the scope of the invention. Such terms or any other terms leading to any confusion, should be objected.
- 11.13 Functional claims, i.e. claims where the substances are defined in terms of their physiological properties/results to be achieved, should be discouraged, as such claims

²⁵ Farbwerke Hoechst Aktiengesellschaft v. Formals Meister Lucius & Bruning a Corporation etc. vs Unichem Laboratories and Ors, AIR1969Bom255, (1974)76BOMLR130

not only lead to confusion regarding the scope of the invention, all most all the times, they are much wider in scope and are inconsistent with descriptions.

11.14 In pharmaceutical patenting, the claims are often drafted in terms of Markush formula. Special care should be given to search and examine such claims. Claims with Markush formulas may cover innumerable compounds and may be overbroad, thus leading to conclusion of inconsistency between description and claims. Also, such formulas can lead to the question of plurality of distinct inventions. Compounds represented by different alternatives should have a technical interrelationship.

11.15 In order to satisfy the requirement of sufficiency of description, the applicant for patent is required to satisfy at least following three conditions, namely (a) the complete specification must describe an embodiment of the invention claimed in each of the claims, (b) the description must be sufficient to enable those in the industry concerned to carry it into effect without making further invention or experiments and (c) the description must be fair i.e. it must not be unnecessarily difficult to follow. Since the sufficient disclosure of the invention to the public through the specification is the basis of the patent grant, the controller [being the custodian of the public rights] has to consider the rights of the public so that the public can exploit the invention commercially [without doing further experiments] after the expiry of the term of patent. Therefore he has to ensure that the description is not ambiguous to understand by the ordinary skilled person.

11.16 Where a single claim defines alternatives of a Markush group, the requirement of a technical interrelationship is considered met when the alternatives are of a similar nature. When the Markush grouping is for alternatives of chemical compounds, the alternatives are regarded as being of a similar nature where the following criteria are fulfilled:

(A) all alternatives have a common property or activity; AND

(B)(1) a common structure is present, that is, a significant structural element is shared by all of the alternatives; OR

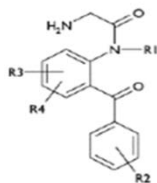
(B)(2) in cases where the common structure cannot be the unifying criteria, all alternatives belong to a recognized class of chemical compounds in the art to which the invention pertains.

The claims of a specification may be said to be linked with a single inventive concept, if they are co-related to reach other by a common thread. For example, the specification may contain a claim for (1) a drug (2) intermediates (3) process of making the compound of claim (1) and (2). However, the intermediates shall be allowed provided they are new and non-obvious and the specification does not disclose any other use of the said intermediates.

11.17 Illustrative examples for sufficiency of disclosure and support:

Example 1:

The alleged invention claims a compound of the following formula



Wherein Wherein, R1 is selected from phenyl, pyridyl, thiazolyl, thioalkyl, alkoxy and methyl; R2-R4 are methyl, tolyl or phenyl, pyridyl... the compounds are used as a pharmaceutical for increasing the oxygen intaking capability of blood.

Description: the specification embraces innumerable compounds covering formula as above. The examples however are restricted to the limitation that R1 is always phenyl, e.g. :

R1	R2	R3	R4
phenyl	tolyl	Phenyl	Methyl
phenyl	tolyl	Pyridyl	Tolyl
phenyl	pyridyl	Methyl	Tolyl

Analysis: In all other examples, the definition of R1 is restricted to Phenyl. The claim is much broader than what has been described and enabled and is therefore lacking in support. It may be noted that sufficiency and support are two different criteria and serve two distinct purposes, despite that they are supplemental to each other. In the example given, the examiner can raise a question of sufficiency also.

Example 2:

An H2 receptor antagonist of formula I

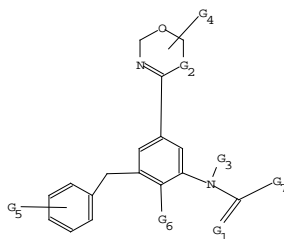
Formula I is depicted as A-Z.

A comprises substituted imidazoles and Z comprises substituted benzimidazoles.

Analysis: At the first place, the term 'Comprises' or 'substituted' are open ended terms and there remains every likelihood that the majority of the compounds claimed would not serve the purpose of the alleged invention. As in above, the examples are limited to only few substituents and do not enable (which is not possible also) other classes of substituents. An objection of insufficiency and support may be raised against such claims and descriptions.

Example 3:

Invention:Discloses a compound of formula 1 having insecticidal property.



G1 represents oxygen or sulphur,

G2 represents oxygen, amino, aminoformyl or aminoacetyl,

G3 represents hydrogen, amino, hydroxyl or represents C1-C6-alkyl, CrC6-alkenyl, C2-C6-alkynyl or C3-C6-cycloalkyl,

G4 independently of one another represent C1-C6-alkyl, C2-C6-alkenyl, C2-C6-alkynyl, C3-C6-cycloalkyl,

n represents 0 to 4,

G5 represents hydrogen, halogen, cyano, nitro, C1-C4-alkyl, C1-C4-haloalkyl, C2-C6-alkenyl, CrC6-haloalkenyl, C2-C6-alkynyl, C1-C4-alkoxy, C1-C4-haloalkoxy,

G6 represents C1-C6-alkyl, C3-C6-cycloalkyl, C1-C6-haloalkyl, C1-C6-halocycloalkyl, C2-C6-alkenyl, C2-C6-haloalkenyl, C2-C6-alkynyl, C2-C6-haloalkynyl, C1-C4-alkoxy,

G7 represents a 5- or 6-membered heteroaromatic ring optionally mono- or polysubstituted

The specification and working examples provides support only for compound of formula I-1 and process for preparing the same.

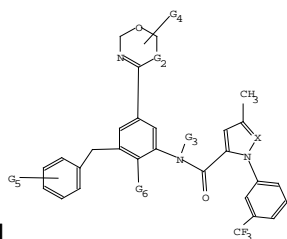


Figure I-1

Where

G1 of Formula I is oxygen

G2 is oxygen, amino,

G3 for hydrogen,

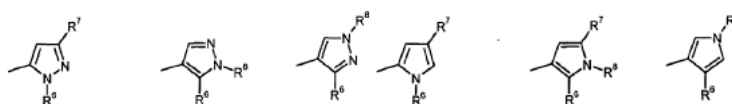
n of Formula I is 0, G4 is absent

G5 is hydrogen, Cl, Br and I

G6 CH3 or Cl

Nitro or C3-c6- Trialkylsilylethynylated is available.

G7 for a pyrazole - or Pyrrole



R6 is chloropyridine

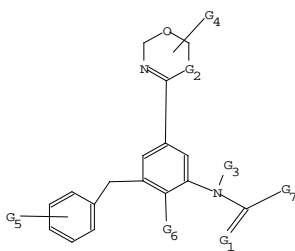
R7 is Cl, Br or CF₃

R8 is H

Although the applicant claims that the compound has insecticidal property the claimed activity has not been demonstrated.

Claim:

An insecticidal compound of formula 1



Wherein

G1 represents oxygen or sulphur,

G2 represents oxygen, amino, aminofornyl or aminoacetyl,

G3 represents hydrogen, amino, hydroxyl or represents C1-C6-alkyl, CrC6-alkenyl, C2-C6-alkynyl or C3-C6-cycloalkyl,

G4 independently of one another represent C1-C6-alkyl, C2-C6-alkenyl, C2-C6-alkynyl, C3-C6-cycloalkyl,

n represents 0 to 4,

G5 represents hydrogen, halogen, cyano, nitro, C1-C4-alkyl, C1-C4-haloalkyl, C2-C6-alkenyl, CrC6-haloalkenyl, C2-C6-alkynyl, C1-C4-alkoxy, C1-C4-haloalkoxy,

G6 represents C1-C6-alkyl, C3-C6-cycloalkyl, C1-C6-haloalkyl, C1-C6-halocycloalkyl, C2-C6-alkenyl, C2-C6-haloalkenyl, C2-C6-alkynyl, C2-C6-haloalkynyl, C1-C4-alkoxy,

G7 represents a 5- or 6-membered heteroaromatic ring optionally mono- or polysubstituted.

Analysis: In the present case the disclosure in the description is not considered sufficient for the entire scope of the subject matter claimed specifically where G1 represents sulphur.

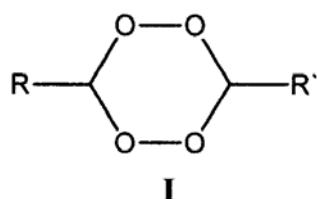
Even though the description sufficiently discloses the compounds where G1 represents oxygen there is a lack of evidence demonstrating the use (insecticidal) of the claimed compound.

Hence can be objected under section 10(4)(a).

As compounds where G1 represents sulphur and the process for preparing the same are not disclosed the specification is not considered enabled for the entire scope of the claims and can be objected under section 10(4)(b).

Example 4:

Description: The invention relates to a the compound represented by general formula I. and a pharmaceutical composition comprising the compound represented by the formula (I) a salt thereof, a solvate thereof, or a prodrug thereof; in combination with other drugs. Compound represented by general formula I is useful in the treatment of cancer.



R and R' are selected from Mono, di, tri, poly substituted aromatic, heteroaromatic, cyclic, acyclic, polycyclic groups.

The working examples provide support only for the following compounds and process for preparing them along with the assay to show anti cancer activity.

3,6-Bis-(ethyl)-[1,2,4,5]tetroxane

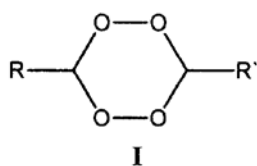
3,6-Bis-(methyl propyl)-[1,2,4,5]tetroxane

3,6-Bis-(tert-butyl-methyl)-[1,2,4,5]tetroxane

3-(Methoxy-methyl)-6-methyl-[1,2,4,5]tetroxane

Claim:

Compound of formula I



R and R' are substituted acyclic/aromatic/heteroaromatic/cyclic/ polycyclic groups

Analysis: The complete specification must describe each embodiment of the invention claimed and the description must be sufficient to enable a person skilled in the art to carry out substantially all that which falls within the ambit of what is claimed without undue experimentation.

There is no support for compounds where R and R' are Mono, di, tri, poly substituted aromatic, heteroaromatic, cyclic or polycyclic groups. To prepare compounds where R and R' are Mono, di, tri, poly substituted aromatic,.

Heteroaromatic, cyclic or polycyclic groups and to find the claimed biological activity involves undue experimentation.

Hence the subject matter of claim 1 where R and R' are Mono, di, tri, poly substituted aromatic, heteroaromatic, cyclic or polycyclic lacksgroups lacks support.

12. UNITY OF INVENTION

12.1 The requirement of unity of invention is provides by the following provision in the Patent Act and Manual of Patent Office Practice and Procedure. As referred above, the provisions of section 10(5) of Patent Act the claim or claims of a complete specification shall relate to a single invention, or to a group of inventions linked so as to form a single inventive concept.

12.2 The MANUAL OF PATENT OFFICE PRACTICE AND PROCEDURE, at 05.03.16 requires that there may be more than one independent claim in a single application if the claims fall under a single inventive concept. While there is no restriction as to the number of claims, including independent claims, it is advisable to limit the number of claims, as well as the number of independent claims in a single application so that the claims are all of cognate character and are linked so as to form a single inventive concept. Inclusion of multiple independent claims directed at non-cognate aspects of the claimed invention is not desirable. If claims relate to a plurality of distinct inventions, it may be objected on ground of lack of unity of invention.

12.3 In other words when there is a group of inventions in a specification they should be linked by a single concept or there should be a technical relationship among the claimed inventions, which makes the inventive contribution over the prior art. To fulfill the requirement of unity of invention each claim of a complete specification should share a single common technical relationship which is inventive. The single common technical relationship which is inventive is called the "special technical feature". This determination should be done on the content of the claims supported by the description in the light of the prior art.

12.4 In the field pharmaceuticals patent applications usually claim, huge number of chemical compounds by Markush structures, chemical compounds as intermediate and final products, compositions comprising different chemical components, processes for their manufacture, their uses or applications, even devices or apparatus used for carrying out specific processes are usually claimed in a single application. Sometimes it becomes complicated to handle search and examination of such combinations of different categories of claims and variable dependency of claims. Interpreting such claims whether claims claimed in the application relate to a single invention or a group of inventions linked so as to form a single inventive concept or lack unity.

12.5 Illustrative example of *a priori* determination of unity of invention:

Example 1:

Claims

- 1) An antibiotic of formula I for treatment of staphylococcal infection.
- 2) A steroid of formula A for treatment of staphylococcal infection.
- 3) A bioactive compound of formula X for treatment of staphylococcal infection.

Analysis: The subject-matter of claims 1-3 does not relate to a single invention, or to a group of inventions linked so as to form a single inventive concept as they relate to structurally different products. As antibiotic of formula I, steroid of formula A and bioactive compound of formula X do not share any common structural feature, which could serve as a unifying feature. Each of these claims has to be considered as a separate invention and said to lack unity a priori.

12.6 Illustrative example of *a posteriori* determination of unity of invention:

Claims

1. A combination, comprising sulphonamide compound X and a taxane and its use in treatment of cancer.
2. A combination, comprising sulphonamide compound X and a vinca alkaloid derivative or analogue thereof and its use in treatment of cancer

Prior art: Use of Sulphonamide compound X in treatment of cancer.

Analysis: Claims 1-2 contain the following inventions or group of inventions, which are not so linked as to form a single general inventive concept as required u/s 10 (5) of the Patents Act.

Group 1: claim 1: A combination, comprising sulphonamide compound X and a taxane

Group 2: claim 2: A combination, comprising sulphonamide compound X and a Vinca alkaloid derivative or analogue thereof .They are not so linked as to form a single general inventive concept in view of the following:

The special technical feature should be an essential structural part common to all of the embodiments of the claimed invention (and responsible for the inventive effect), and which is absent in the prior art that provide the same solution. Upon prior art search, it is found that use of Sulphonamide compound X in treatment of cancer is already known in the prior art. Taxane, and vinca alkaloid derivative are structurally different from each other. The only common component is the sulphonamide compound X which is already known as an anticancer agent. Hence here it is considered that a common technical link in the above mentioned groups is not inventive. The above mentioned groups lack common feature which could be regarded as the special technical feature providing unity to the application. Consequently, the application may be objected for lacking unity a posteriori.

12.7 Combinations of Different Categories of Claims

Illustrative examples showing combinations of different categories of claims

Example 1:

Claim 1: A compound of formula I

Claim 2: A method of preparing the compound of formula I.

Claim 3: Compound of formula I for use as a fungicide.

Unity exists between claims 1, 2 and 3 as the special technical feature is compound of formula I.

Example 2

Claim 1: A process of manufacture of compound of formula I comprising steps A and B.

Claim 2: Apparatus specifically designed for step A.

Claim 3: Apparatus specifically designed for step B.

Unity exists between claims 1 and 2 or between claims 1 and 3. Claims 2 and 3 lack unity since there exists no common special technical feature between the two claims.

Example 3

Claim 1: A compound of formula I

Claim 2: A process of manufacture of compound of formula I comprising step A.

Claim 3: Apparatus specifically designed for step A.

Unity exists between claims 1, 2 and 3 as the special technical feature is compound of formula I. However, if the compound of formula I is known in the art, unity would be lacking because there would not be a special technical feature common to all the claims. However the process should essentially results in compound of formula I and contribution over the prior art of the apparatus specifically designed for step A should corresponds to the inventive feature of the process of claim 2.

12.8 Unity of invention in Markush claims

12.9 In Markush claims the unity of invention shall be considered to be met when the alternatives claimed are of a similar nature. The Markush group of alternative chemical compounds, can be regarded as being of a similar nature is subjected to the fulfillment of the following conditions:

- a) They have a common property or activity,
- b) All of the alternatives have a common structure, which is a significant structural element shared by all of the alternatives (it includes compounds that share a common chemical structure which occupies a large portion of their structures, or compounds that have in common only a small portion of their structures, which constitutes a structurally distinctive portion in view of the prior art, and is essential to the common property or activity),

12.10 Illustrative example showing unity of invention in Markush claims

Example 1:

A compound of the formula:

R1-R2-R3

wherein R1 is indolyl moiety and R2-R3 are methyl, benzyl, or phenyl. The compounds are useful as pharmaceutical for treatment of asthma.

In this case the compound A has a significant structural element that is shared by all of the alternatives and all the claimed compounds possess the same activity. Thus all the claimed compounds possess unity.

Example 2

The claim relates compound

R1-R2-R3

Wherein R1 is a heterocyclic moiety comprising diverse molecular species and R2-R3 are methyl, benzyl, or phenyl. The molecular variations of R1 encompasses huge number of moieties which cannot be structurally linked and cannot be said to fall within single inventive concept.

12.11 Unity of invention in Intermediate and Final Product

12.12 The term "intermediate" includes intermediate and starting products which have the ability to be used to be used in a process to produce the final product through a physical or chemical change in which the identity of the intermediate is lost. The fulfillment of the requirement of unity of invention between intermediate and final product, is subjected to the fulfillment of the following conditions:

a) the intermediate and final product should have the same essential structural element, i.e. the basic chemical structure of the intermediate and the final product are the same, or the chemical structure of the intermediate and final product are technically closely interrelated, with the intermediate incorporating an essential structural element into the final product,

and

b) technically interrelated, also meaning that the final product is manufactured directly from the intermediate or is separated from it by a small number of intermediates all sharing the same essential structural element.

12.13 Illustrative example for Unity of invention in Intermediate and Final Product

Example 1:

Claim 1: (intermediate)

Claim 2: (final product)

The chemical structures of the intermediate and final product are technically closely interrelated. The essential structural element incorporated into the final product is:

Therefore, unity exists between claims 1 and 2.

Illustrative example 2

Claim 1: I (final product)

Claim 2: II (intermediate)

Compound (II) is described as an intermediate to make (I). The closure mechanism is one well known in the art. Though the basic structures of compound (I) (final product) and compound (II) (intermediate) differ considerably, compound (II) is an open ring precursor to compound (I). Both compounds share a common essential structural element therefore considered to be technically closely interrelated.

This example therefore satisfies the requirement for unity of invention.

12.14 To satisfy unity of invention between intermediate and final products when any one or both the structures are not known, there should be sufficient evidence to conclude that the intermediate and final products are technically closely interrelated such as

the intermediate contains the same essential element as the final product or incorporates an essential element into the final product.

- 12.15 Different intermediate products used in different processes for the preparation of the final product, satisfy unity of invention provided that they have the same essential structural element
- 12.16 To satisfy unity of invention the intermediate and final products should not be separated, in the process by an intermediate which is not new.
- 12.17 Different intermediates for different structural parts of the final product, do not satisfy unity of invention.
- 12.18 To satisfy unity of invention where the intermediate and final products are families of compounds, each intermediate compound should correspond to a compound claimed in the family of the final products.
- 12.19 Where unity of invention is recognized the fact that, the intermediates also exhibit other properties or activities should not affect the unity of invention.

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