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Datasheet for the decision of 23 June 2008

Case Number: T 0699/05 - 3.3.05

Application Number: 00913216.8

Publication Number: 1196227

IPC: B01D 9/02

Language of the proceedings: EN

Title of invention:
Method for using laser light to control crystal form

Appellant/Applicant:
Intellectual Ventures Holding 19, LLC

Headword:
Using laser light to control crystal form/INTELL. VENTURES HOLDING LLC

Relevant legal provisions:
EPC Art. 54, 56, 84, 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Clarity, support (yes - after amendment)"
"Novelty (yes)"
"Inventive step - (yes - after amendment; - non obvious alternative)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0699/05 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 23 June 2008

Appellant: Intellectual Ventures Holding 19, LLC
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 22 October 2004 refusing European application No. 00913216.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: G. Raths
Members: H. Engl
S. Hoffmann

Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division to refuse European patent application no. 00913216.8.

II. The examining division held that a disclaimer in claim 1 contravened Article 123(2) EPC and that claim 1 was not properly supported by the description and failed to recite the features necessary to achieve the desired result, contrary to Article 84 EPC.

III. An appeal was filed against this decision with a letter dated 15 November 2004 and the appeal fee paid at the same time.

With the statement of the grounds of appeal, filed with a letter dated 24 February 2005, the appellant submitted a new set of claims 1 to 14 as the sole request and filed, in support of the argumentation provided, the following documents:

Exhibit 1: K. Allen *et al.*, "The Crystallisation of Glycine Polymorphs from Emulsions, Microemulsions and Lamellar Phases", Crystal Growth & Design, Vol. 2, No. 6, pages 523 to 527 (2002);

Exhibit 2: C.S. Towler *et al.*, "Impact of Molecular Speciation on Crystal Nucleation in Polymorphic Systems: The Conundrum of gamma - Glycine and Molecular Self-Poisoning", J. Am. Chem. Soc. 126, 13347-13353 (2004); and

Exhibit 3: US-B1-6 624 406.

IV. The board issued a communication pursuant to Article 110(2) EPC 1973 (Rule 100(2) EPC 2000) raising objections under Article 84 (lack of support by the description and lack of clarity) against claims 1 and 11. The method of claim 1 also did not seem to be disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person over its whole breadth (Article 83 EPC).

V. In response to the said communication the appellant filed additional observations and a new set of claims replacing those filed previously.

In a letter dated 5 May 2008 the appellant filed new patent claims containing a minor editorial amendment to claim 1 and pages 4, 5, 6, 8, 9 and 10 of the description adapted to the claims.

The sole independent claim thereof reads as follows:

"*1. A method of preparing a gamma polymorph of glycine, comprising the steps of:*
a) preparing a supersaturated solution of glycine in a solvent; and
b) subjecting the supersaturated solution of glycine to polarized laser light having a wavelength of 1.06μm so as to induce the onset of nucleation of crystals of the gamma polymorph of glycine from the supersaturated solution."

VI. The appellant's arguments may be summarized as follows:

Regarding clarity: Subitems a) and b) of Claim 1 recited all the instructions necessary for the skilled person for preparing a polymorph of a known substance which was restricted to glycine. Specifically, explicit mention was made of the preparation of a supersaturated solution in a solvent and the wavelength of 1.06 μm of the laser light, so as to induce the nucleation of a gamma polymorph of glycine. The appropriate output and the polarisation of the laser could be determined by the skilled person quickly and routinely. The treatment time of up to one hour was only a preferred embodiment yielding the best results. The onset of nucleation of crystals took place before that time, even during laser light irradiation, but the fraction of gamma polymorph formed was possibly below detection level. The exact duration of irradiation with laser light was therefore not of utmost importance.

Regarding support: The appellant pointed to the example in the description which demonstrated the practicability of the claimed invention. The example of glycine was chosen because it had been used as a model substance for decades precisely because the results achieved with glycine could be applied to a great number of other substances. Evidence for this was provided in Exhibits 1 and 2. Another working example of the invention was disclosed in co-pending US-B1-6,624,406 filed as Exhibit 3.

The objection of the examining division regarding the disclaimer was rendered moot by deleting the disclaimer.

VII. The appellant requested that the decision of the examining division be rescinded and a patent be issued on the basis of claims 1 to 8 filed with a letter dated 5 May 2008.

Reasons for the Decision

1. *Amendments*

Claim 1 is based on the disclosure of the application as filed (*i.e.* WO-A-01/02075), in particular on claims 1, 2, 7, 9 and 12. More specifically, a process for preparing the gamma polymorph of glycine is disclosed on page 8, line 28 to page 9, line 29 (*"Experimental"*). Although it is stated at page 9, lines 14 to 22 and page 10, lines 11 to 13, that in fact a mixture of the gamma polymorph with a small percentage of the alpha polymorph was obtained, the disclosed process makes it indeed possible to produce the desired gamma polymorph.

Claims 2 to 8 correspond, respectively, to claims 2, 4, 5, 6, 9 and 10 of the application as filed.

The subject matter of claims 1 to 8 thus fulfils the requirements of Article 123(2) EPC.

2. *Article 84 (clarity, support)*

2.1 In the decision under appeal the examining division rejected claim 1 (then on file) on the ground that it

failed to specify the features necessary to achieve the stated result.

According to current claim 1 and the description, the desired result consists in inducing the onset of nucleation of crystals of the gamma polymorph of glycine.

In the board's opinion, current claim 1 recites the essential process features leading to said nucleation of the gamma polymorph. In accordance with the description, in particular page 8, line 27 to page 10, line 2, crystals of the desired gamma polymorph were observed to be growing after irradiation of a supersaturated solution of glycine with polarized laser light having a wavelength of 1.06 μm. No other features are presented in the description as being essential to the invention.

The board accepts in this context that the time period of several hours reported in the experimental section is not mandatory, for the following reasons. Although it is stated on page 9, lines 24 to 26, that suitable laser irradiation times range from approximately 0.1 seconds to approximately 1 hour using a laser operating at 10 pulses per second, it will be understood by the skilled person that the effective minimum irradiation time depends *inter alia* on laser power, pulse frequency and degree of supersaturation, the disclosed period of up to one hour thus being merely preferred. Therefore, the exact duration of irradiation with laser light is not an essential feature of the invention and thus need not be stated in the independent claim.

The appellant also plausibly argued that, according to the example in the description, the polymorph could first be **observed** after **several hours** of irradiation. **Initiation** of crystal growth, however, started earlier, possibly even beginning during laser irradiation, when the fraction of gamma polymorph was still below detection level. Several hours of irradiation time are therefore not necessary to achieve the onset of nucleation of crystals.

2.2 The contested decision correctly states in point 2.2 thereof that the invention cannot be worked with urea solutions, as the crystallites that are formed under the influence of laser light have the same structure as crystallites formed by spontaneous nucleation. By limiting the claims to glycine, the appellant took care of this point, so that no further comments are necessary.

2.3 As a third objection under Article 84 EPC, the contested decision stated that claim 1 was broader than justified by the description, having in particular regard to the fact that only one working example (concerning glycine) was provided. Apparently, the examining division considered the sole example concerning glycine as unfit for generalisation by the skilled person so as to cover the whole breadth of the claim (then on file).

This objection, too, has been rendered moot by restricting the claimed process to the preparation of the gamma polymorph of glycine.

3. *Novelty*

3.1 Prior art

3.1.1 The priority date of 6 July 1999 is validly claimed. Consequently, the document US-A-5 976 325, published on 2 November 1999 and cited in the International Search Report, does not belong to the state of the art.

Exhibits 1, 2, and 3 are all published after the filing date of the present application and do not belong to the state of the art.

The document *"Merck Index"*, 11th Edition, 1989, Merck & Co., Inc., USA, pages 57 and 1533 (cited in the International Search Report) relates to the chemical properties and uses of the compounds aluminium hydroxide and urea and is therefore of no relevance for the claimed subject matter.

The Supplementary European Search Report does not cite any further relevant documents.

3.1.2 The document

D1: B. A. Garetz *et al*., Physical Review Letters, Vol. 77, No. 16 (1996), pages 3475, 3476,

is cited in the description (page 4, lines 9 to 11) and in the International Search Report. Said document reports on photophysical phenomena observed on supersaturated solutions of urea upon irradiation with 1.06 μm pulses of polarized laser light. The authors (one of them a co-inventor of the present application)

could visually observe the onset of nucleation and the formation of needle-shaped urea crystallites typically within 10 to 20 seconds after beginning of the irradiation. Shortly thereafter, the sample completely solidified. The effect was considered surprising because urea has no electronic absorption bands or vibrational bands at the applied wavelength (page 3475, paragraphs four to eight). The authors discuss the phenomenon in terms of alignment of the crystal axis of urea with the applied electric field vector.

3.2 Since glycine is not mentioned in document D1, the claimed methods are novel. The requirements of Article 54(1)(2) EPC are met.

4. *Inventive step*

4.1 Even if according to the jurisprudence of the Boards of Appeal the "closest state of the art" is normally a prior art document disclosing subject-matter aiming at the same objectives as the claimed invention and having the most relevant technical features in common, for the board, in this case, the introduction under the heading *"Prior art"* and the *"Brief summary of the invention"* appearing in the patent application itself (page 1, line 10 page 4 line 11 and page 4, line 12 to page 6, line 10) is of assistance. So, in the absence of a further document apart from document D1 on which it is commented under point 3.1.2 above, the board relies on the introduction of the application in suit.

4.2 It is true that document D1, as the sole available prior art document published before the effective filing date of the application in suit, relates to

irradiation with 1.06 μm pulses of polarised light. However, since it does not give any hint to apply this technique to glycine, which is not mentioned (see point 3.1.2), the only appropriate course is to start from the acknowledged circumstances described in the application itself. The description of the application represents the situation in which the person skilled in the art was at the priority date of the application in suit. The board sees no reasons to deviate from this state of the art as the starting point for further development.

4.3 According to the description of the application as filed (page 8, lines 12 to 15), the amino acid glycine is known to form at least three different polymorphs under different conditions. The alpha form usually forms from neutral aqueous solutions whereas the gamma form forms from acidic or basic aqueous solutions.

4.4 Therefore, the problem underlying the application under appeal consists in providing an alternative method of preparing the gamma polymorph of glycine.

4.5 It is plausible from the experimental evidence contained in the application as filed (page 8, line 26 to page 10, line 28) that the proposed solution according to claim 1 effectively solves the above mentioned technical problem.

4.6 It remains to be decided whether or not this solution involves an inventive step.

Document D1 is completely silent on the key issue of the formation of polymorphic forms; in fact, polymorphism is not mentioned at all.

As discussed in the description, page 7, first paragraph, of the application under appeal, laser induced nucleation of supersaturated urea solutions produces crystallites of the same structure as those which form when the same solution spontaneously nucleates. Since thus in the case of urea the use of laser light does not lead to a polymorphic form different from that obtained by spontaneous nucleation without the use of the laser light, any particular nucleation effect obtained with the laser light could not have been observed by Garetz *et al.* who studied urea solutions. Let alone could Garetz *et al.* have suggested the formation of the gamma polymorph of glycine by irradiation of a supersaturated solution with polarized laser light of a specific wavelength.

Now, the invention according to the application in suit concerns a method of preparing a gamma polymorph of glycine by using laser light to cause the nucleation and crystal growth to occur in such a way as to obtain the said gamma polymorph which would not normally appear without the use of the laser. Thus, this key feature of the present application, as claimed in claim 1, cannot be derived from D1.

Other documents concerning the issue at stake are not on file.

4.7 The Board concludes that the subject-matter of claim 1 involves an inventive step (Article 56 EPC).

4.8 The dependent claims 2 to 8 define preferred embodiments of the inventive process and derive their patentability from claim 1.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent on the basis of the following application documents:

claims 1 to 8, as filed with letter of 5 May 2008;

description, pages 1 to 3 and 7, as published as WO-A-01/02075, and pages 4 to 6 and 8 to 10, as filed with letter of 5 May 2008;

figures 1/6 to 6/6, as published as WO-A-01/02075.

The Registrar The Chairman

D. Magliano G. Raths