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Datasheet for the decision of 21 November 2017

Case Number: T 1637/15 - 3.3.05

Application Number: 08380068.0

Publication Number: 1997793

IPC: C05G1/00, C05D9/02

Language of the proceedings: EN

Title of invention:
Heteromolecular metal-humic (chelate) complexes

Patent Proprietor:
Timac Agro España, S.A.

Opponent:
Akzo Nobel Chemicals International B.V.

Headword:
Humic complexes/TIMAC AGRO

Relevant legal provisions:
EPC Art. 83

Keyword:
Sufficiency of disclosure - main request (no) - undue burden - new research program - auxiliary request (yes) - completeness of disclosure

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 1637/15 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 21 November 2017

Appellant: (Opponent)	Akzo Nobel Chemicals International B.V. Velperweg 76 6824 BM Arnhem (NL)
Representative:	Akzo Nobel IP Department Velperweg 76 6824 BM Arnhem (NL)
Respondent: (Patent Proprietor)	Timac Agro España, S.A. Polígono Arazuri-Orcoyen Calle C n° 32 31160 Orcoyen, Navarra (ES)
Representative:	Hubert, Philippe Cabinet Beau de Loménie 158, rue de l'Université 75340 Paris Cedex 07 (FR)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 19 June 2015 concerning maintenance of the European Patent No. 1997793 in amended form.**

Composition of the Board:

Chairman	E. Bendl
Members:	J.-M. Schwaller
	P. Guntz

Summary of Facts and Submissions

I. The present appeal lies from the interlocutory decision of the opposition division to maintain European patent No. 1 997 793 in amended form (the sole amendment with respect to the granted patent is at page 4 of the description).

Claim 1 as granted reads as follows:

"1. Heteromolecular metal complexes (chelates) with the general formula:
$[organic\ molecule\ A]_n$-$(Metal)_x$-$[organic\ molecule\ B]_m$
obtained by a process that comprises steps of:
a) preparing (Metal)-[Organic Molecule B] complex in an aqueous medium
b) adding the complex formed in a) onto a solution of Organic Molecule A at pH between 7 and 10, at temperature between 25°C and 80°C and at pressure between 1 and 2 atmospheres,
Where organic molecule A is a humic acid, or several humic acids, or any fraction thereof, or a complete humic system containing humic acids, or several complete humic systems containing humic acids; organic molecule B is a multitoothed organic molecule; and the metal is any metal in any oxidation state, such as Fe, Cu, Mn, Zn, B, Se, Ca, Mg, Al and Co.
The values of n, x and m are set by the metal co-ordination number and the number of complexing (chelating) centres in molecules A and B."

II. With the grounds of appeal, the opponent (the "appellant") contested the decision, in particular on the basis of a new translation of D6 (CN 1 064 670 A) and a new experimental report (D9), and it objected to the granted claims under Articles 83, 54 and 56 EPC.

III. With its reply to the grounds of appeal, the patentee (the "respondent") contested appellant's arguments in particular on the basis of a new experimental report and commercial brochures of a product called "Borregro HA-1" (D11, D11a) used in experimental report D10. Further it declared maintaining the six auxiliary requests filed on 25 April 2015 before the opposition division.

IV. In response to the summons to oral proceedings, the appellant reiterated its objections of novelty based on documents D1 ("Humic Acid and Iron Uptake by Plants", D.J. Linehan, Plant and Soil, 50, pages 663 to 670 (1978)), D6 and D7 ("Kinetics of Trace Metal Complexation: Ligand-Exchange Reactions", J.G. Hering et al., Environ. Sci. Technol., vol. 24, 2, pages 242 to 252 (1990)).

Further it objected to the subject-matter of said auxiliary requests under Articles 123(2), 54 and 56 EPC.

V. At the oral proceedings, held on 21 November 2017, the discussion focused in particular on the question of whether or not the invention was sufficiently disclosed on the whole scope of protection claimed. The respondent then withdrew all the pending auxiliary requests and submitted a single amended auxiliary request, claim 1 of which reads:

"*1. Heteromolecular metal complexes (chelates) with the general formula:*

[organic molecule A]$_n$-(Metal)$_x$-[organic molecule B]$_m$

obtained by a process that comprises steps of:

a) preparing (Metal)-[Organic molecule B] complex in an aqueous medium

b) adding the complex formed in a) onto a solution of Organic Molecule A at pH between 7 and 10, at temperature between 25°C and 80°C and at pressure between 1-2 atmospheres,
Where:
- *organic molecule A is a humic acid, or several humic acids;*
- *organic molecule B is a multitoothed organic molecule which is selected from citric acid, salicylic acid and ethylenediamine;*
- *and the metal is Fe (III).*

The values of n, x and m are set by the metal co-ordination number and the number of complexing (chelating) centres in molecules A and B."

This auxiliary request further contains ten dependent claims.

The only objection raised by the appellant with respect to this request concerned sufficiency of disclosure of the invention.

VI. After closure of the debate, the chairman established appellant's request that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed or, alternatively, that the patent be maintained in amended form on the basis of the set of claims according to the auxiliary request filed during the oral proceedings.

VII. The arguments of the parties, insofar as they are relevant to the present decision, can be summarised as follows:

- For the **appellant**, the claimed invention did not fulfill the requirements of Article 83 EPC at least over its full scope of protection. In particular, it was clear from respondent's arguments regarding the disclosures of D1, D6 or D7 that the description of the patent at issue was incomplete and that the preparation steps defined in claim 1 did not inevitably lead to the claimed heteromolecular complex.

- The **respondent** argued that the description, and in particular the examples, gave sufficient information for reproducing the claimed heteromolecular metal complexes. The preparation processes disclosed in each of documents D1, D6 and D7, however, did not lead to the formation of said complexes.

Reasons for the Decision

1. Claims as granted - Sufficiency of disclosure

1.1 The board observes that the patent does not disclose any method of how the skilled person can verify whether the claimed heteromolecular metal complex is formed.

1.2 Said complex is, however, defined by means of a product-by-process claim, with the process features comprising the following sequence of steps:
a) preparing (metal)-[organic molecule B] complex in an aqueous medium, and
b) adding the complex formed in a) onto a solution of organic molecule A at pH between 7 and 10, temperature between 25°C and 80°C and pressure between 1 and 2 atmospheres.

The answer to the question of whether the invention could be carried out by the skilled person appears on a first glance positive, given the definition of the processing conditions at issue. However, in the course of the discussion at the oral proceedings and in view of respondent's reasoning with regard to the disclosure of documents D7 and D6 this turned out to be incorrect.

1.2.1 D7 describes inter alia the reaction at pH 7.4 of calcein (a dye which falls under the definition of organic molecule A) with copper (the metal) and humic acid (organic molecule B).

With respect to D7, the respondent argued that if a calcein-copper-humic acid heteromolecular complex was formed during the experimental tests described in D7, this was unstable and immediately dissociated.

For the board this argument shows, in contrast to the wording of claim 1 at issue which claims the preparation of a heteromolecular complex with a "multitoothed organic molecule", that the claimed complex with the required stability (see paragraph [0014] of the published specification) is not necessarily obtainable for all types of "multitoothed organic molecule".

1.2.2 D6 (see steps 1 to 4 of the method disclosed at pages 4 and 5 of the new translation) discloses the preparation of a complex by adding citric acid, urea, tartaric acid and disodium EDTA to a humic acid solution at room temperature so as to prepare a complexing agent and a stabiliser; then compounds of copper, boron, manganese, iron, molybdenum and cobalt are added in that order to generate the complex; a plant growth regulator is further added along with phosphorus and potassium

salts, and the pH is adjusted to around 6 to 8 using ammonium bicarbonate.

The complex according to D6 is thus prepared differently from the one defined in claim 1 at issue, the reactants being added in a different order than presently claimed. The appellant however contended, on the basis of its experimental report D9, that the preparation of the "heteromolecular metal complex" according to claim 1 at issue was neither dependent from the pH nor from the sequence of adding the reactants, and it concluded that the product according to D6 fell under the wording of claim 1 at issue.

The respondent argued that the product BorreGro HA-1 that the appellant used as the "humic acid" in D9 was described in D11a as having been made according to the process disclosed in D16 (US 5 663 425 A). In example 1 of D16, a humic acid-containing ore is treated with formaldehyde, sodium metabisulfite and the mixture is reacted with sodium hydroxide at pH 10-11 and 160°C for 90 minutes. The respondent explained that D6 did not disclose a heteromolecular metal complex as claimed, because the strong reaction conditions destroyed the humic acid to such an extent that it no longer could be qualified as "humic acid" in the sense of claim 1 at issue so that the complex as claimed was not formed.

For the board, the product obtained in example 1 of D16 however can be equated with the expression "or any fraction thereof" - i.e. a "fraction" of a humic acid - and so this argument of the respondent clearly shows that the claimed product cannot be necessarily obtained with "a fraction of a humic acid", as required by claim 1 at issue.

1.3 For the board, the respondent's arguments regarding the disclosure of documents D6 and D7 show that the sequence of steps a) and b) currently defined in claim 1 as granted is not sufficient for the skilled person to prepare the great variety of heteromolecular metal complexes claimed.

Furthermore, apart from the limited number of complexes prepared in the examples of the patent, for which there is a clear disclosure of how they are to be prepared, the description of the patent does not provide the skilled person with any details or guidance of how further heteromolecular metal complexes can be prepared. For the board, it is therefore undue burden for the skilled person to find out the operating conditions for the preparation of each individual heteromolecular complex claimed, with the consequence that the invention in its current extremely broad wording amounts to a new research program, which according to the case law of the boards of appeal is contrary to Article 83 EPC.

2. Auxiliary request - admissibility

No objection concerning admissibility of this request has been raised by the appellant.

For the board, the filing of this request at the oral proceedings is clearly admissible, since it is based on auxiliary request 7 - filed on 20 October 2017 in response to the board's preliminary opinion - and differs therefrom in essence only by the deletion in claim 1 of the feature "or any fraction thereof". Since this deletion - which restricts the scope of protection of the claimed invention - has been generated by the discussion of document D6 at the oral proceedings (see

point 1.2.2 above), the board does not see any reason not to accept this request, as its subject-matter does not introduce any new issues and meets the requirements of the EPC, in particular those of Article 83 EPC (see point 3. below).

3. Auxiliary request - sufficiency of disclosure

3.1 In comparison to claim 1 as granted, claim 1 of the current request no longer contains the features ("a fraction thereof", "a multitoothed organic molecule" which can e.g be calcein) which, during the discussion of documents D6 and D7, were found critical for the issue of sufficiency of disclosure. Furthermore, the broad wording of claim 1 as granted has been restricted to a small number of heteromolecular complexes for which the preparation conditions are disclosed in the description, in particular the examples.

The preparation of the claimed heteromolecular humate-iron citrate or salicylate is in particular clearly described in examples 1 to 3, and the preparation of a similar complex with EDTA is regarded to be within the competence of the person skilled in the art, at least in the absence of evidence to the contrary and in view of the recipe given in examples 1 to 3, which is considered to be transposable to the preparation of a heteromolecular humate-iron EDTA complex.

3.2 The board furthermore does not accept appellant's argument that the currently claimed invention could not be carried out at pH 7 because D1 - which reproduced the sequence of steps defined in claim 1 - did not achieve the synthesis of a humic acid-iron citrate complex.

In fact, D1 discloses (see page 664, lines 12 and 13 of the heading "methods", and Figure 1 at page 665) the preparation of a Hoaglands nutrient solution containing **ferric citrate** (a "*(Metal)-[Organic molecule B] complex*" according to claim 1 at issue) and **humic acid** (an "*organic molecule A*" according to claim 1 at issue) at different **pHs** of from 5 to **7**. It is plausible to the board, as explained by the respondent, that the Hoaglands nutrient solution used in the experimental part of D1 contained so much calcium that a humic acid-iron citrate heteromolecular complex could not be formed.

The board observes that the Hoaglands nutrient solution used in D1 was neither mentioned in the current patent, nor used in the preparation of the complexes synthesised in examples 1 to 3 of the patent. The appellant having moreover not reproduced any of said examples, there is currently no evidence on file that the preparation process described in examples 1 to 3 would not lead to the heteromolecular complex claimed.

Furthermore, the pH range of D1 (5.0 to 7.0) overlaps with the one claimed (7 to 10) only in the specific value 7. Thus, even if the skilled person had difficulties in obtaining heteromolecular metal complexes at the isolated value of pH 7 - which has not been proven - this would not, in the absence of any further evidence, be detrimental to the skilled person's ability to put the claimed invention as a whole into practice (see the case law of the Board of Appeal, 8th ed., II.C.5.6.1).

3.3 It follows from the above considerations that the board is not convinced that the claimed invention does not satisfy the requirements of Article 83 EPC.

3.4 This objection being the sole that was raised by the appellant, the patent is maintained in amended form on the basis of the auxiliary request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Opposition Division with the order to maintain the patent on the basis of the amended auxiliary request submitted during oral proceedings and a description to be adapted thereto.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated