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**Datasheet for the decision
of 18 April 2017**

Case Number: T 2178/14 - 3.3.05

Application Number: 04749657.5

Publication Number: 1622709

IPC: B01J2/00

Language of the proceedings: EN

Title of invention:

Ethylene oxide catalyst

Applicant:

SD Lizenzverwertungsgesellschaft mbH & Co. KG

Headword:

Silver catalyst/SD

Relevant legal provisions:

EPC Art. 54(1), 54(2), 54(3), 56, 84

Keyword:

Main request - clarity (yes) - after amendment

Main request - Novelty (yes) - after amendment

Main request - Inventive step (yes) - unexpected improvement

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
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Case Number: T 2178/14 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 18 April 2017

Appellant: SD Lizenzverwertungsgesellschaft mbH & Co. KG
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted on 13 June 2014
refusing European patent application No.
04749657.5 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman E. Bendl
Members: J.-M. Schwaller
R. Winkelhofer

Summary of Facts and Submissions

- I. This appeal lies from the decision of the examining division to refuse European patent application No. 04 749 657.5.
- II. According to the decision, the wording of claim 1 of the then pending main request *inter alia* was unclear and the subject-matter of claim 1 of the both then pending auxiliary requests lacked inventive step over document D4 (EP 0 764 464 A2) taken in combination with the teaching of document D1 (US 2002/0010094 A1).
- III. With its statement of grounds of appeal, the appellant filed eight sets of claims, with the main, first and second auxiliary requests being identical with those underlying the decision.
- IV. The board issued a communication under Article 15(1) RPBA and expressed its preliminary opinion. *Inter alia* document D6 (EP 1 492 619 B1), referred to as "copending application" in the application in suit, was cited as novelty-destroying anticipation.
- V. With submission of 24 March 2017, the appellant submitted a new main request with a single claim reading:

"1. A process for the preparation of a catalyst for the production of ethylene oxide comprised of silver supported on an alumina carrier, comprising a pretreatment step at a pH in the range of 10 to 13.0 for removing sodium ions from the carrier, wherein the alumina carrier is contacted with an aqueous basic solution at a temperature lower than 100°C, wherein during the pretreatment step the pH of the treating

solution is maintained in the 10 to 13.0 range by continuous or intermittent addition of base to the solution, and impregnating the pretreated carrier with an impregnating solution comprising 5-50 wt% silver, expressed as metal."

- VI. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the sole claim of the new main request filed with its submission of 24 March 2017 or, alternatively, on the basis of one of the sets of claims according to auxiliary requests 1 to 7 filed with the statement of grounds of appeal or, on the basis of the claims of the auxiliary request 8 submitted on 21 February 2017, said auxiliary request 8 corresponding to the main request filed with the statement of grounds of appeal.

Reasons for the Decision

1. Main request

- 1.1 Admissibility

The amendments represent an attempt of the appellant to overcome the deficiencies raised in the board's communication. They also overcome the objection of lack of clarity raised by the examining division.

Therefore, the board exercises its discretion to admit this amended set of claims (Article 13(1) RPBA).

- 1.2 Article 123(2) EPC

The sole claim of this request has its basis in claims 1 and 3 as originally filed in combination with the

passages at page 2, lines 9 to 14 and page 5, lines 6 to 9 of the application as filed.

It therefore meets the requirements of Article 123(2) EPC.

1.3 Clarity

Taking into account the amendments carried out by the appellant, the board does not see any reason to object to lack of clarity.

1.4 Priority

D6 was published as WO 2003/086624 on 23 October 2003, i.e. between the priority date (23 April 2003) and the filing date (1 April 2004) of the application in suit. It needs to be determined whether D6 represents state of the art according to Article 54(3) EPC or, in case that the priority has not been validly claimed, according to Article 54(2) EPC.

The features of the sole claim of the main request can be found in the priority document in claims 1 and 3 and the passages of the description on page 2, lines 10 to 15 and page 5, lines 6 to 8 of the priority document. Priority, therefore, has been validly claimed.

As a consequence thereof, D6 is state of the art according to Article 54(3) EPC.

1.5 Novelty

Document D6, that the board held to be novelty-destroying for the claims then on file, discloses the

pretreatment of an alumina carrier with 0.02 N lithium hydroxide at 65°C.

D6 does not disclose that during the pretreatment step "*the pH of the treating solution is maintained in the 10 to 13.0 range by continuous or intermittent addition of base to the solution*", therefore the subject-matter of claim 1 at issue is novel over this document.

This sole claim is also novel over the other documents cited in the examination proceedings. This was also not contested in the decision under appeal.

The sole claim at issue therefore meets the requirements of Article 54(2) and (3) EPC.

1.6 Inventive step

The application in suit concerns a process for the preparation of a silver catalyst for the oxidation of ethylene to ethylene oxide having improved properties (page 1, lines 9 to 11).

- 1.6.1 Both documents cited during the examination phase, namely D1 and D4, relate to the same problem (see D1, paragraph [0012] and D4, page 2, lines 7/8 and 39/40).

D4 however discloses the pretreating of the porous carrier with a lithium or cesium compound **before** the impregnation step.

As such a step is not found in D1, D4 is considered to have more features in common than D1, so that D4 represents the closest prior art to the claimed subject-matter.

- 1.6.2 The problem to be solved by the application in suit vis-à-vis D4 is the provision of a process for the production of catalysts having superior properties compared to the ones of the prior art (page 1, lines 22/23 of the application in suit).
- 1.6.3 As the solution to this problem the appellant proposes the process according to the sole claim, in particular the maintenance of the pH during the pretreatment step between 10 and 13.0 by continuous or intermittent addition of base to the solution.
- 1.6.4 Table B of the application in suit shows that the pH value of a treatment solution without maintenance of the pH at a certain level leads to a drop of pH value. Table 4 shows that maintenance of pH has a direct impact on Na removal and Table 5 shows that the stability and selectivity of the catalyst is directly dependent thereon. Thus, given these tests the problem underlying the invention has effectively been solved.
- 1.6.5 The question to be answered is whether the proposed solution would have been obvious for a person skilled in the art.

D4 recommends to pretreat the porous carrier with a lithium or cesium compound, for instance a lithium and a cesium carbonate (page 3, lines 32 to 38 and Example 1(1)). However, no teaching is given to maintain the pH at a specified level.

D1, paragraph [0018], discloses that the "ionizable species", inter alia sodium, may be removed from the carrier by washing with a solution which may contain for instance lithium carbonate. D1, however, stresses not to use "aggressive medias such as acids or bases",

and neither discloses nor teaches the maintenance of the pH between 10 and 13.0 during the washing pretreatment.

On the contrary, a pH of 11.2 or more is disclosed only for the impregnation step, i.e. after the pretreatment step of the carrier.

Thus, it is doubtful whether the skilled person would combine the teaching of D1 with the disclosure of D4. And even if this were the case, the process as currently claimed would not be rendered obvious either, as the claimed pretreatment is not taught or recommended in the available prior art.

Furthermore, as none of the documents cited in the search report suggests or discloses the claimed pretreatment for obtaining more durable silver-based ethylene oxide catalysts, the claimed subject-matter is not rendered obvious from the known prior-art documents, with the consequence that the sole claim of this request meets the requirements of Article 56 EPC.

2. Since the sole claim of the main request meets the requirements of the EPC, there is no need to consider the lower-ranking requests.

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 claim 1 of the main request filed with letter of 24 March 2017, and a description to be adapted.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated