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**Datasheet for the decision
of 3 March 2011**

Case Number: T 0056/08 - 3.3.01

Application Number: 02803592.1

Publication Number: 1444217

IPC: C07D 301/06

Language of the proceedings: EN

Title of invention:

Direct epoxidation process using carbonate modifiers

Patentee:

Lyondell Chemical Technology, L.P.

Opponent:

THE DOW CHEMICAL COMPANY

Headword:

Epoxidation with palladium and carbonates/LYONDELL

Relevant legal provisions:

EPC Art. 123(2), 54

Relevant legal provisions (EPC 1973):

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Keyword:

"Main request: amendments (allowable): clearly and unambiguously derivable from the application as filed"
"Novelty (yes): no direct and unambiguous disclosure"
"Remittal"

Decisions cited:

T 0941/98, T 0666/89, T 0892/07

Catchword:

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Case Number: T 0056/08 - 3.3.01

D E C I S I O N
of the Technical Board of Appeal 3.3.01
of 3 March 2011

Appellant: Lyondell Chemical Technology, L.P.
(Patent Proprietor) Two Greenville Crossing
4001 Kennett Pike
Suite 238
Greenville, DE 19807 (US)

Representative: De Hoop, Eric
Octrooibureau Vriesendorp & Gaade B.V.
P.O. Box 266
NL-2501 AW Den Haag (NL)

Respondents: THE DOW CHEMICAL COMPANY
(Opponent) 2030 Dow Center
Midland
Michigan 48674 (US)

Representative: Marsman, Hermanus Antonius M.
Vereenigde
Johan de Wittlaan 7
NL-2517 JR Den Haag (NL)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 25 October 2007
revoking European patent No. 1444217 pursuant
to Article 102(1) EPC (1973).

Composition of the Board:

Chairman: P. Ranguis
Members: G. Seufert
L. Bühler

Summary of Facts and Submissions

- I. The Appellant (Patent Proprietor) filed an appeal on 21 December 2007 against the decision of the Opposition Division dated 25 October 2007 revoking European patent no. 1 444 217, and on 4 March 2008 filed a written statement setting out the grounds of appeal.
- II. In this decision the following numbering will be used to refer to the documents:
- (1) WO 98/00414
- III. Opposition was filed requesting revocation of the patent in suit in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC).
- IV. The decision under appeal was based on a main request consisting of the claims as granted and first to third auxiliary requests filed during oral proceedings before the Opposition Division.
- The Opposition Division held that the subject-matter of the main request was not novel in view of document (1), and that the first to third auxiliary requests did not comply with Article 123(2) EPC. In addition, the first auxiliary request was considered to be unclear.
- V. With the statement of grounds of appeal the Appellant filed a new main request and auxiliary requests I-V, the main request being practically identical to the second auxiliary request of the decision under appeal. All previous requests were withdrawn.

The main request consists of 17 claims, independent claims 1, 10 and 14 reading as follows:

"1. A process for producing an epoxide comprising reacting an olefin, oxygen, and hydrogen in the presence of a modifier and a catalyst comprising palladium and titanium zeolite, wherein the modifier is (a) calcium carbonate in the presence of carbon dioxide or (b) ammonium bicarbonate."

"10. A process comprising reacting propylene, hydrogen and oxygen in a solvent in the presence of ammonium bicarbonate and a catalyst comprising palladium and a titanium silicalite."

"14. A process comprising reacting propylene, hydrogen and oxygen in a solvent in the presence of a modifier and a catalyst comprising palladium and a titanium silicalite, wherein the modifier is calcium carbonate in the presence of carbon dioxide."

Auxiliary request I differs from the main request in that dependent claims 2-7 and 10 have been deleted.

Auxiliary request II differs from the main request in that the respective amounts of calcium carbonate, carbon dioxide and ammonium bicarbonate have been added to the independent claims.

Auxiliary request III is a combination of auxiliary request I and auxiliary request II; the dependent claims 2-7 and 10 have been deleted and the respective amounts of calcium carbonate, carbon dioxide and

ammonium bicarbonate have been added to the independent claims.

Auxiliary request IV is identical to claims 11 to 18 as granted.

Auxiliary request V is based on auxiliary request IV with the addition of the respective amounts of ammonium bicarbonate, calcium carbonate and carbon dioxide to the independent claims.

- VI. In its reply to the statement of grounds of appeal, the Respondent, referring to Article 12(2) of the Rules of Procedure of the Boards of Appeal (RPBA), contested the admissibility of auxiliary requests I-V, because the Appellant had provided arguments only in support of its main request.
- VII. Both parties requested oral proceedings on an auxiliary basis.
- VIII. With the summons to oral proceedings, the Board sent a communication pursuant to Article 15(1) RPBA, expressing its preliminary view that auxiliary requests I-V appeared to be admissible and that the main request appeared to comply with Article 123(2) and 54 EPC. In particular, the Board indicated that dependent claims 2-9 were identical to claims 2-4 and 6-10 as originally filed, which already disclosed the combination of the general process using a noble metal catalyst with particular features, and noted that palladium was clearly defined as the preferred noble metal on page 4, lines 3-6 of the description. The combination of original claim 1 as well as the

combination of each of the original dependent claims with palladium as the only added feature would, therefore, not appear to extend the subject-matter beyond the application as filed. Concerning novelty, the Board questioned whether document (1) clearly and unambiguously disclosed the compulsory presence of palladium. Furthermore, the Appellant was invited to provide the basis for the amendments in auxiliary requests II, III and V. The Board also indicated its intention of remitting the case to the department of first instance for further prosecution, if it were to come to the conclusion that at least one of the requests met the requirements of Articles 123(2) and 54 EPC.

IX. In reply to the summons the Appellant's representative with letter dated 9 February 2011 informed the Board that he would not attend the oral proceedings.

X. With letter of 25 February 2011, the Respondent informed the Board that with regard to the Appellant's reply to the summons the "Opponent sees no longer a reason to attend the Oral Proceedings" and requested that "a decision be made based on the written proceedings".

XI. The Appellant's written arguments, to the extent that they are relevant for this decision, can be summarised as follows:

The main request, which is almost identical to the second auxiliary request of the decision under appeal, met the requirement of Article 123(2) EPC. The various combinations of preferences were implicitly disclosed

in the application as filed. The combination of propylene and palladium, for example, was clearly derivable, as propylene was mentioned as a preferred olefin on page 6, lines 24-25 and palladium as a preferred noble metal on page 4, line 6 of the application as filed, even if the corresponding dependent claims 5 and 7 were dependent only on claim 1. The objection made by the Opposition Division was contrary to EPO practice and not supported by any specific case law.

The subject-matter of the main request was novel over document (1) in view of the fact that document (1) related to a catalyst comprising gold and not palladium as the noble metal.

XII. The Respondent's written arguments, to the extent that they are relevant for this decision, can be summarised as follows:

The Appellant's main request violated the requirement of Article 123(2) EPC in view of the fact that the subject-matter of the dependent claims in combination with amended claim 1 represented a selection from more than one list. The originally filed claims did not support such an amendment as they were not multiple-dependent. Nor were the combinations supported by the original description. Furthermore, according to claim 4 of the main request, the catalyst was comprised of from 0.01 to 10 weight percent palladium. The paragraph on page 4, lines 3-8 of the application as filed stated "the catalyst employed in the process of the invention also contains a noble metal" (emphasis added by the Respondent). Palladium was explicitly mentioned in that

paragraph, but the word "contains" was more restrictive than the word "comprises".

Claim 1 of the main request was not novel in view of the disclosure of document (1), particularly in view of the combination of example 6c, using the preferred promoter metal calcium, with the particularly preferred embodiment mentioned on page 14, lines 24-29 of document (1) describing that the at least one promoter metal preferably contained less than 0.01 weight percent palladium.

- XIII. The Appellant requested in writing that the decision under appeal be set aside and that the patent be maintained on the basis of the main request or, alternatively, on the basis of one of auxiliary requests I to V, all requests being filed with the statement of grounds of appeal dated 4 March 2008.

- XIV. The Respondent requested in writing that the appeal be dismissed, the patent be revoked in its entirety and the auxiliary requests be considered inadmissible.

- XV. At the end of the oral proceedings, which took place as scheduled on 3 March 2011 in the absence of both parties, the decision of the Board was announced.

Reasons for the Decision

- 1. The appeal is admissible.

Main request

2. *Amendments*

2.1 The main request differs from the claims as granted in that the catalyst in claim 1, and consequently in dependent claim 4, has been limited to the obligatory presence of a specific noble metal, namely palladium. This feature can be found in claim 5 as originally filed, which is identical to claim 5 as granted, **as well as** on page 4, lines 4-6 of the original description, where palladium is furthermore described as particularly desirable.

Independent claims 10 and 14 and their dependent claims 11-13 and 15-17 have not been modified and are identical to claims 11-18 as granted.

2.2 With the exception of the amendment in dependent claim 4 bringing it into line with claim 1, the Appellant's main request is identical to the second auxiliary request of the decision under appeal, which the Opposition Division considered to contravene Article 123(2) EPC as far as dependent claims 2-9 were concerned.

2.2.1 The Opposition Division noticed that each of dependent claims 2-10 as granted was only dependent on claim 1. Following the introduction of the feature of dependent claim 5 into claim 1, the Opposition Division was of the opinion that the subject-matter of each of dependent claims 2-9 of the second auxiliary request before it (identical to the claims 2-4 and 6-10 as granted) led to new combinations, for example the

combination of a particular olefin, namely propylene, or particular solvents, namely methanol, ethanol, isopropanol or tert-butanol, with a specific noble metal, namely palladium. In the Opposition Division's opinion, these combinations were not supported by the application as filed.

2.2.2 The Respondent adopted the Opposition Division's position, arguing that the subject-matter of the dependent claims 2-9 of the main request was the result of a selection from more than one list.

2.3 The Board does not share this position. Although the original claim structure may not provide a basis for the combination of palladium with the particular features of dependent claims 2-9 of the main request (which are still dependent only on claim 1), these combinations are nevertheless clearly and unambiguously derivable from the application as filed for the following reasons:

The Board notes that the subject-matter of a dependent claim includes all features of the independent claim(s) on which it is dependent. A dependent claim, therefore, already discloses the combination of all the features of the independent claim with the particular feature(s) of the dependent claim. Accordingly, in the present case, each of dependent claims 2-4 and 6-10 as originally filed already discloses the combination of the general process for the production of an epoxide using a catalyst comprising a noble metal, titanium zeolite and a specific modifier with its particular feature; for example the combination of a noble metal with titanium silicalite is disclosed in originally

filed claim 2, the combination of a noble metal with propylene in originally filed claim 7 and the combination of noble metal with specific solvents in originally filed claim 10. Thus, by introducing palladium into claim 1 of the main request the only selection which has actually been made in claims 2-9 of the main request vis-à-vis dependent claims 2-4 and 6-10 as originally filed is that of a particular noble metal, namely palladium, from among all noble metals. A list of possible noble metals, including the explicitly mentioned palladium, is disclosed on page 4, lines 4-6 of the application as filed. Since selection from only one list is not to be objected to under Article 123(2) EPC, the arguments of the Opposition Division and the Respondent cannot succeed.

2.4 The Respondent also referred to various parts of the description, in which the particular features of dependent claims 2-9 of the main request were further mentioned, arguing that none of these parts, including the working examples, supported a combination of the features of claims 2-9 with palladium. Furthermore, the Respondent argued that the term "contains" disclosed on page 4, lines 3-8 of the application as filed in connection with the noble metals, including palladium, was more restrictive than the term "comprises", without however providing any explanation as to why that might be the case.

2.5 In view of the finding that the subject-matter of dependent claims 2-9 is clearly supported by the originally filed dependent claims in combination with page 4, line 6 of the original description (point 2.3 above), the Respondent's arguments that it cannot find

support for the combinations in particular parts of the description are without merit. Concerning the Respondent's argument that the verb "to contain" has a more restrictive meaning than the verb "to comprise", the Board would point out that the general meaning of the verb "to contain" is "to have in it", "to hold", "to include", "to encompass" or "to comprise". Therefore, the Respondent's argument cannot be accepted.

2.6 Since the amendments made to the claims as granted are supported by the application as originally filed, the Board comes to the conclusion that the main request meets the requirement of Article 123(2) EPC. The amendments lead to a restriction of the scope of the claims as granted. Therefore, Article 123(3) EPC is likewise complied with.

3. *Clarity*

The Respondent did not contest the clarity of the main request. The Board sees no reason to take a different view.

4. *Novelty*

4.1 Claim 1 of the main request is directed to an epoxidation process of olefins with oxygen and hydrogen in the presence of a catalyst comprising palladium and titanium zeolite and a modifier, the modifier being either calcium carbonate in the presence of carbon dioxide or ammonium bicarbonate.

4.2 In the decision under appeal, the Opposition Division decided that the process of claim 1 of the patent in

suit as far as the alternative of a catalyst comprising a noble metal, titanium zeolite and calcium carbonate as modifier was concerned lacked novelty in view of example 6c of document (1). Since the Appellant has limited claim 1 of its main request to a catalyst comprising palladium, it has to be established whether document (1) directly and unambiguously discloses an epoxidation process using the presently claimed catalyst comprising palladium, titanium zeolite and calcium carbonate as a modifier.

4.3 Example 6c of document (1) describes the epoxidation reaction of propylene with oxygen and hydrogen in the presence of a catalyst prepared from chloroauric acid and calcium nitrate ($\text{Ca}(\text{NO}_3)_2 \cdot 4 \text{H}_2\text{O}$) as promoter metal on TS-1, a titanium zeolite. Since the promoter metal compound is contacted in water with sodium carbonate during preparation, the Opposition Division came to the conclusion that the formation of calcium carbonate was inherent during calcination of the catalyst. This finding was not challenged by the Appellant. The Board too sees no reason to question this conclusion of the Opposition Division. Example 6c is the only example in document (1) using calcium as a promoter metal. It does not disclose the presence of palladium as a catalyst (or a promoter) component; in fact, none of the examples or comparative examples does. Thus, example 6c alone cannot anticipate the subject-matter of claim 1 of the main request.

4.4 The Respondent based its objection of lack of novelty of claim 1 of the main request on example 6c of document (1) in combination with page 14, lines 24-29 of that document.

4.4.1 In this context, the Board notes that, although in the examination of novelty the teaching of a prior-art document is not limited to the detailed information given in the examples but encompasses the disclosure of that document as a whole, in deciding what is clearly and unambiguously derivable from a document different passages can be combined only if the skilled person would see a good reason for doing so (see unpublished decision T 941/98, point 5.1 of the reasons; T 666/89, OJ EPO 1993, 495; or unpublished decision T 892/07, point 4.4.3 of the reasons).

4.4.2 The passage on page 14, lines 24-29 of document (1) referred to by the Respondent clearly states that the promoter metal, which includes metals of groups 1 to 12 of the Periodic Table as well as rare-earth lanthanides and actinides, preferably **excludes** palladium, and even more preferably excludes a Group VIII metal. The meaning of the expression "excludes" is explained as the total concentration of the Group VIII metal(s) being less than 0.01 weight percent.

Thus, in view of the statement that palladium is preferably excluded the skilled reader of document (1) had no good reason to combine it with example 6c already containing calcium as a promoter metal. Such a modification of example 6c is the result of an ex post facto interpretation of document (1) made with the knowledge of the invention and the purpose of reconstructing the claimed method.

4.4.3 Nor can the aforementioned passage be understood as a clear and unambiguous disclosure of the inevitable

presence of palladium in the catalyst system of document (1). The specific definition of the term "excludes" on page 14 of that document (i.e. less than 0.01 weight percent) merely allows for the **possibility** of small amounts of group VIII metals, not even necessarily palladium, being present, and includes their total absence. This definition cannot be construed as the obligatory presence of such promoter metals. Furthermore, no evidence has been provided that the promoter metal in example 6c, namely calcium nitrate, or chloroauric acid for that matter, includes palladium by definition.

4.5 Neither the Opposition Division nor the Respondent had any objections regarding the novelty of the subject-matter of independent claims 10 and 14. The Board sees no reason to take a different view.

4.6 For the reasons set out above, the Board comes to the conclusion that the subject-matter of the main request is novel within the meaning of Article 54 EPC.

5. *Remittal*

In the decision under appeal the Opposition Division revoked the patent on the grounds of lack of novelty and non-compliance with Articles 84 and 123(2) EPC. The examination of inventive step has not yet been concluded. In these circumstances, the Board considers it appropriate to exercise the power conferred on it by Article 111(1) EPC to remit the case to the Opposition Division for further prosecution.

6. *Auxiliary requests I-V*

Since the Board has come to the conclusion that the Appellant's main request is supported by the application as originally filed and novel over the disclosure of document (1), and has decided to remit the case to the department of first instance, there is no need to decide on the admissibility of any of auxiliary requests I-V.

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 for further prosecution.

The Registrar:

The Chairman:

M. Schalow

P. Ranguis