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**Datasheet for the decision  
of 18 March 2010**

**Case Number:** T 0434/08 - 3.3.07

**Application Number:** 02023624.6

**Publication Number:** 1306130

**IPC:** B01J 27/122

**Language of the proceedings:** EN

**Title of invention:**

Catalysts containing cooper and magnesium for oxychlorination  
of ethylene to 1,2-dichloroethane

**Patent Proprietors:**

SÜD - CHEMIE CATALYSTS ITALIA S.R.L.

**Opponents:**

BASF SE

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 113(2)  
RPBA Art. 13, 12

**Relevant legal provisions (EPC 1973):**

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**Keyword:**

"Late-filed claims not admitted"  
"No allowable text agreed upon by the Appellants"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0434/08 - 3.3.07

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.07  
of 18 March 2010

**Appellants:**  
(Patent Proprietors) SÜD - CHEMIE CATALYSTS ITALIA S.R.L.  
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**Representative:** Stolmár, Matthias  
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**Respondents:**  
(Opponents) BASF SE  
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**Representative:** Huhn, Michael  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 3 January 2008  
revoking European patent No. 1306130 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** S. Perryman  
**Members:** F. Rousseau  
D. Semino

## Summary of Facts and Submissions

I. The Appellants (Patent Proprietors) lodged an appeal on 29 February 2008 against the decision of the Opposition Division issued in writing on 03 January 2008 revoking European patent 1 306 130, in respect of European patent application No. 02023624.6.

II. The patent as granted comprised eight claims, claims 1 and 6 reading as follows:

"1. Catalysts for the oxychlorination of ethylene to 1,2-dichloroethane, comprising compounds of Cu and Mg supported on alumina and having a copper content, expressed as Cu, of 2 to 8% by weight, characterized in that the Mg/Cu atomic ratio is from 1.3 to 2.5, with distribution of the copper atoms more inside the particle of the catalyst than on the surface (layer with a thickness of 20-30 Å) and of the magnesium atoms more on the surface (20-30 Å layer) than inside the particle, and in that the specific surface of the catalyst is from 30 to 130 m<sup>2</sup>/g.

6. The catalysts according to any one of claims 1 to 5, characterized in that the support is gamma alumina with a purity such that the impurity content (expressed as Na) is less than 10 ppm."

III. Notice of Opposition had been filed by the Respondents (Opponents) requesting revocation of the patent as granted in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and

insufficiency of disclosure (Article 100(b) EPC), based *inter alia* on the following documents:

(3) US-A-5 527 754

(6) US-A-5 315 051.

IV. The decision of the opposition division was based on five sets of claims submitted by the Patent Proprietors on 29 October 2007. The Opposition Division held that the subject-matter of the main, first and second auxiliary requests did not meet the requirements of Article 123(2) EPC, while the subject-matter of the third auxiliary request was not inventive over the disclosure of document (3) and the subject-matter of the fourth auxiliary request was anticipated by that document.

V. With the statement setting out the grounds for appeal, the Appellants submitted on 02 May 2008 five sets of claims constituting their main and first to fourth auxiliary requests, claim 1 of the main request corresponding to claim 1 as granted.

VI. On 12 October 2009 the Board dispatched a summons to attend oral proceedings.

VII. The Appellants submitted with their letter dated 23 February 2010 six additional sets of claims forming the basis for their fifth to tenth auxiliary requests, claim 1 of the fifth auxiliary request, corresponding to a combination of claim 1 and 6 as granted, reading as follows (the additions made to claim 1 as granted being indicated in bold):

"1. Catalysts for the oxychlorination of ethylene to 1,2-dichloroethane, comprising compounds of Cu and Mg supported on alumina and having a copper content, expressed as Cu, of 2 to 8% by weight, characterized in that the Mg/Cu atomic ratio is from 1.3 to 2.5, with distribution of the copper atoms more inside the particle of the catalyst than on the surface (layer with a thickness of 20-30 Å) and of the magnesium atoms more on the surface (20-30 Å layer) than inside the particle, and in that the specific surface of the catalyst is from 30 to 130 m<sup>2</sup>/g, **wherein the support is gamma alumina with a purity such that the impurity content (expressed as Na) is less than 10 ppm.**"

VIII. Prior to and during the oral proceedings before the Board, which took place on 18 March 2010, the debate on inventive step of claim 1 of the main request had focussed on the following points:

- (a) Document (3) and document (6) represented an equivalent starting point for assessing inventive step, as they both related to catalysts for the oxychlorination of ethylene to dichloroethane capable of providing high selectivities at temperature above 230°C both in the oxygen process and in the air process.
- (b) It was undisputed that both the catalysts of the patent in suit and those disclosed in documents (3) and (6) were obtained by dry impregnation of a gamma alumina substrate with aqueous solutions of copper and magnesium salts, *i.e.* by using a volume of solution equal to, or smaller than, the

porosity of the alumina substrate. Neither was it disputed that the copper content of 2 to 8% by weight and the specific surface of the catalyst from 30 to 130 m<sup>2</sup>/g did not constitute a distinguishing feature over the catalysts disclosed in documents (3) and (6). The Board also informed the parties that a Mg/Cu atomic ratio from 1.3 to 2.5 could not represent a distinguishing feature, as this range overlapped with the ratios disclosed in documents (3) and (6).

- (c) Consequently, the distribution of copper and magnesium atoms as defined in claim 1 of the main request was the sole feature, if any, which could distinguish the claimed catalysts from those of documents (3) and (6). It resulted according to the Appellants from the dry impregnation and the presence in the impregnation solution of hydrochloric acid in quantities of 1 to 2 equivalents per g-atom of Cu.
- (d) In the absence of any comparison with the catalysts prepared in either document (3) or (6), the problem solved by the claimed distribution of copper and magnesium atoms could only be seen in the provision of further catalysts for the oxychlorination of ethylene to dichloroethane both in the oxygen process and in the air process.
- (e) The dry impregnation of the alumina with a solution of the metal chlorides in the presence of hydrochloric acid was however a possibility taught in document (3).

(f) After deliberation, the Board therefore gave the preliminary opinion that if it were possible to attribute to the catalysts defined in claim 1 of the main request any distinguishing feature over those disclosed in documents (3) and (6), it merely resulted from dry impregnation of the alumina with a solution of the metal chlorides in the presence of hydrochloric acid in quantities of 1 to 2 equivalents per g-atom of Cu, which steps starting from the catalysts disclosed in either document (3) or (6) would have been obvious for the skilled person, if he merely wanted to provide further catalysts for the oxychlorination of ethylene to dichloroethane both in the oxygen process and in the air process.

IX. In reaction to the preliminary opinion of the Board, the Appellants withdrew their first and second auxiliary requests. The third and fourth auxiliary requests were in turn withdrawn following a debate on their allowability in respect of Articles 123(2) and 84 EPC.

X. The Appellants finally requested that the decision under appeal be set aside and the patent be maintained on the basis of the claims of the fifth auxiliary request as submitted on 23 February 2010, *i.e.* the Appellants did not pursue the patent in the form of their main or sixth to tenth auxiliary requests as submitted respectively with the statement setting out the grounds for appeal or with their letter dated 23 February 2010.

XI. The Appellants' arguments in relation to the fifth auxiliary request can be summarized as follows:

- (a) Claim 1 of the fifth auxiliary request was based on granted claims 1 and 6. It defined the support to be gamma alumina, its impurity content being defined in terms of its sodium content as being less than 10 ppm. According to paragraph [0028] of the patent, the catalysts prepared with such a support would be more stable, *i.e.* more resistant to abrasion. As a consequence, the claimed catalyst did not produce fines while in use, avoiding the deposit of fines on the bed cooling tubes and thereby allowing a better control of the reaction temperature.
- (b) There were no reasons to doubt that said advantages would exist, as they were credible.
- (c) Gamma alumina supports having such a low content of sodium were commercially available on request.
- (d) The use of a low amount of sodium in the gamma alumina support was not suggested by the cited prior art. Document (6) in particular did not consider a low content of sodium to be of any relevance, as the catalysts described therein were prepared by depositing sodium chloride on the alumina support.

XII. The Respondents requested that the appeal be dismissed.

XIII. The Respondents' arguments in relation to the fifth auxiliary request can be summarized as follows:

- (a) No excuse had been offered by the Appellants for the late submission of the fifth auxiliary request.
- (b) In line with decisions T 0097/00 and T 0355/97, alleged but unsupported technical effects should not be taken into account for assessing inventive step. Hence, the Appellants' allegation, that the feature freshly introduced into independent claim 1, *i.e.* a content of sodium in the gamma alumina support of less than 10 ppm, solved the problem of improving the abrasion resistance of the catalyst, should be disregarded as it was not supported by experimental evidence.
- (c) Gamma alumina supports with such a low sodium content were not readily available on the market.
- (d) In addition, allowing the fifth auxiliary request into the proceedings would result in debating a new aspect of the patent in suit which had never been discussed before.
- (e) Hence, the late filed fifth auxiliary request should not be admitted into the proceedings.

XIV. At the end of the oral proceedings, the decision of the Board was announced.

## Reasons for the Decision

1. The appeal is admissible.
2. The sole set of claims on which the Appellants are requesting maintenance of the patent has been submitted more than 21 months after the expiry of the delay for submitting the statement setting out the grounds of appeal, more than 4 months after the parties were summoned to attend oral proceedings before the Board and only about three weeks before the oral proceedings.
3. Article 12(2) RPBA, first sentence, provides that the statement of grounds of appeal shall contain a party's complete case. Article 13(1) RPBA specifies some of the criteria that a board shall apply in exercising its discretion to admit and consider amendments to a party's case, namely complexity of the subject-matter submitted, the current state of the proceedings and the need for procedural economy, while Article 13(3) RPBA adds that amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise issues which the Board or the other parties cannot reasonably be expected to deal with without adjournment of the oral proceedings.
4. Until the oral proceedings before the Board, the debate on inventive step had been based on the distribution of the copper and magnesium atoms in the alumina substrate, which allegedly provided advantages in terms of selectivity at high temperature and yield. This distribution was said to result from the use of a dry impregnation step in the presence of hydrochloric acid in quantities of 1 to 2 equivalents per g-atom of Cu.

5. The feature of a gamma alumina support having an impurity level defined in terms of sodium content being less than 10 ppm was merely defined in a dependent claim of the patent in suit, to which no significance had been attributed in the opposition and appeal proceedings. It was only about three weeks before oral proceedings before the Board, that this feature was introduced into claim 1 by submitting the fifth auxiliary request and a line of arguments in support of inventive step was given. It was based on the allegedly solved technical problem of providing catalysts which are more stable (less crumbly), have higher abrasion resistance, *i.e.* do not produce during reaction fines that would be lost through the cyclone separators and/or might deposit on the bed cooling tubes, thus hindering the heat exchange and accordingly the control of the reaction. This problem, however, is different and unrelated to that discussed previously in the opposition and appeal proceedings.
  
6. According to the established jurisprudence of the Boards of Appeal, each of the parties to the proceedings carries the burden of proof for the facts it alleges. In the absence of any technical explanations rendering credible that a content of sodium of less than 10 ppm is necessary to render the catalyst resistant to abrasion, a mere assertion concerning these effects in paragraph [0028] of the patent, which paragraph attributes the effects already to a sodium impurity content of less than 50 ppm and only preferably to less than 10 ppm, cannot replace the necessary required evidence and an objective evaluation of the evidence by the Board.

7. To properly assess these newly put forward claims in the light of the prior art, the Board would have needed to have evidence from the parties on three new issues raised by these claims, namely firstly when putting into practice the teaching of document (3) or document (6) what would be the level of sodium impurities in the gamma alumina which a skilled person might choose to use in the absence of any specific teaching in these documents on a desirable upper limit for sodium as an impurity; secondly what improvement over the results achieved by document (3) or document (6), if any, would experiments show for using gamma alumina with sodium impurities less than 10 ppm; and thirdly would the skilled person be in a position to obtain or make for himself gamma alumina with this low level of sodium impurities. As this evidence was not on file, if the request had been admitted into the proceedings the case would have had to be remitted to the first instance or continued in writing before the Board, to afford each party the necessary opportunity to file such evidence and to comment on this or to file counter-evidence. The general rule is that the case should be ready for decision at the time of the oral proceedings before the board, so that a late filed claim request which raises new issues, as in this case, will only be admitted into the proceedings in quite exceptional circumstances. The Board sees no such special circumstances here and in the exercise of its discretion under Rule 13(3) RPBA refuses to allow the request into the proceedings. If the Patent Proprietors/Appellants wished to file such a request, this should have been done on appealing the decision of the opposition division revoking the patent, and the necessary evidence to support the request

should have been filed already with the statement of grounds.

8. Article 113(2) EPC stipulates that the instances of the EPO shall examine and decide upon a European patent only in the text submitted to it, or agreed, by the proprietor of the patent. In the present case, the Proprietors agreed only to the text of the patent in suit submitted as fifth auxiliary request. However, that fifth auxiliary request was not admitted into the proceedings for the reasons given above. Thus, in the absence of any valid request in the proceedings, the patent in suit must be revoked.

**Order**

**For these reasons it is decided that:**

1. The appeal is dismissed.

The Registrar

The Chairman

S. Fabiani

S. Perryman