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**Datasheet for the decision  
of 23 January 2020**

**Case Number:** T 0482/16 - 3.3.02

**Application Number:** 07729938.6

**Publication Number:** 2032677

**IPC:** C10G45/08, B01J23/85, B01J35/10

**Language of the proceedings:** EN

**Title of invention:**  
CATALYTIC HYDRODEOXYGENATION OF AN OXYGENATE FEEDSTOCK

**Applicant:**  
Albemarle Netherlands B.V.

**Headword:**

**Relevant legal provisions:**  
EPC Art. 54, 56, 84, 123(2), 113(1)  
EPC R. 103(1)(a)

**Keyword:**

Amendments - allowable (yes)

Clarity (yes)

Novelty - (yes)

Inventive step - (yes)

Right to be heard - substantial procedural violation (yes)

Reimbursement of appeal fee - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 0482/16 - 3.3.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.02**  
**of 23 January 2020**

**Appellant:** Albemarle Netherlands B.V.  
(Applicant) P.O. Box 103  
3800 Amersfoort (NL)

**Representative:** SSM Sandmair  
Patentanwälte Rechtsanwalt  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 12 August 2015  
refusing European patent application No.  
07729938.6 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** M. O. Müller  
**Members:** M. Maremonti  
L. Bühler

## Summary of Facts and Submissions

I. The appeal by the applicant (hereinafter "appellant") lies from the decision of the examining division to refuse European patent application No. 07 729 938.6.

II. The application as filed contains 13 claims, independent claim 1 of which reads as follows:

*"1. A method for the hydrodeoxygenation of an oxygenate feedstock comprising contacting said feedstock with a sulphided catalyst composition under hydrodeoxygenation conditions, wherein said catalyst composition comprises:*

*i) a porous carrier substantially comprised of alumina, said carrier comprising between 0 to 1 wt.% phosphorous and between 0 and 1 wt.% silicon (both calculated as oxides) and having a mean pore diameter in the range from 5 nm to 40 nm; and,*

*ii) from 1 to 20 wt.% of an active metal component (calculated as oxides based on the weight of the composition) borne on said porous carrier and which comprises at least one Group VIB metal and at least one Group VIII metal."*

Claims 2 to 13 define particular embodiments of the method in claim 1.

III. The following documents were referred to, *inter alia*, during the examination proceedings:

D1: US 4 357 263

D2: EP 1 795 576 A

D3: Laurent and Delmon, *"Study of the hydrodeoxygenation of carbonyl, carboxylic and*

*guaiacyl groups over sulfided CoMo/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> and NiMo/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> catalysts. II. Influence of water, ammonia and hydrogen sulfide", Applied Catalysis A, 109, 1994, pages 97 to 115*

D4: US 4 552 650

D5: Benchebiba L. and Abdeldjelil M., "*Etude de faisabilité de la production d'essence sans plomb au niveau de la nouvelle raffinerie de Hassi Messaoud RHM2*", Master Thesis at University of Oran, Algeria, Academic year 2013-2014

The examining division came to the following conclusions on the then pending requests (main request and auxiliary requests 1 to 3 as filed during the oral proceedings):

- The subject-matter of claim 1 of the main request did not involve an inventive step in view of D1 taken as the closest prior art.
- The subject-matter of claim 1 of the main request and each of auxiliary requests 1 to 3 was not novel over the disclosure of document D3.

Furthermore, the examining division rejected the request of the appellant for the oral proceedings to be adjourned.

IV. In its statement of grounds of appeal, the appellant contested the reasoning of the examining division and argued that the subject-matter claimed in the enclosed main request and auxiliary request was novel over document D3 and involved an inventive step in view of the cited state of the art.

V. The appellant was summoned to oral proceedings, in accordance with its request.

In preparation for the oral proceedings, the board issued a communication in which it expressed the preliminary opinion that the claim requests filed by the appellant with its statement of grounds of appeal were not clear as required by Article 84 EPC. Moreover, the claimed subject-matter did not seem to involve an inventive step in view of D3 taken as the closest prior art.

- VI. In its response dated 31 December 2019, the appellant filed a new main request and new auxiliary requests 1 and 2 to replace all previous requests.
- VII. Oral proceedings before the board were held on 23 January 2020, during which the appellant filed a new main request to replace the previous main request. Moreover, it requested the reimbursement of the appeal fee in view of a procedural violation that had occurred in the first-instance proceedings.
- VIII. Appellant's requests
- The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request filed during the oral proceedings on 23 January 2020, or, alternatively, on the basis of one of auxiliary requests 1 and 2 filed by letter dated 31 December 2019. The appellant further requested that the appeal fee be reimbursed pursuant to Rule 103(1)(a) EPC.
- IX. The arguments of the appellant, where relevant for the present decision, may be summarised as follows:
- Claim 1 of the main request was based on claims 1, 2 and 6 and on page 12, lines 4 to 7, of the application as filed.

- Claim 1 clearly defined the oxygenate feedstock to comprise triglycerides.
- Document D3 could be regarded as the closest prior art. The subject-matter of claim 1 differed from D3 at least in the concentration of hydrogen sulfide and in that the feedstock comprised triglycerides.
- The presence of triglycerides in the feedstock was not suggested in D3. In fact, this document mentioned "pyrolysis oil", which did not contain triglycerides, as these did not withstand a pyrolysis treatment, which was normally carried out at 500°C or higher.
- Pyrolysis was not done with triglyceride-type feeds such as used cooking oils or waste animal fat, but it was rather carried out on the more stable woody/lignocellulosic biomass or algae.
- It had to be concluded that the subject-matter of claim 1 involved an inventive step.

## **Reasons for the Decision**

Main request - compliance with Article 123(2) EPC

1. Claim 1 of the main request filed on 23 January 2020 during the oral proceedings recites the following, with the amendments compared to claim 1 as filed (II, *supra*) highlighted by the board:

*"1. A method for the hydrodeoxygenation of an oxygenate feedstock comprising contacting said feedstock with a sulphided catalyst composition under hydrodeoxygenation conditions, **under the addition of hydrogen sulphide or a precursor thereof such that the hydrogen sulphide is***

**present in the hydrogen gas in an amount between 10ppm and 10000 ppm, wherein the oxygenate feedstock comprises triglycerides, wherein said catalyst composition comprises:**

- i) a porous carrier substantially comprised of alumina, said carrier comprising between 0 to 1 wt.% phosphorous and between 0 and 1 wt.% silicon, ~~(both calculated as oxides)~~, and having a mean pore diameter in the range from 5 nm to 40 nm; and,
- ii) from 1 to 20 wt.% of an active metal component, ~~(calculated as oxides based on the weight of the composition)~~, borne on said porous carrier and which comprises at least one Group VIB metal and at least one Group VIII metal."

Claims 2 to 8 define particular embodiments of the method in claim 1.

- 1.1 The subject-matter of claim 1 is based on claims 1, 2 and 6 and on page 12, lines 4 to 10, of the application as filed. In particular, page 12, lines 4 to 10, discloses the "**addition** of hydrogen sulphide or a precursor thereof" (emphasis added by the board).
- 1.2 Dependent claims 2 to 8 correspond to claims 5, 7 to 11 and 13 as filed.
- 1.3 The board thus concludes that the subject-matter of the claims according to the main request is directly and unambiguously disclosed in the application as filed, so that the requirements of Article 123(2) EPC are met.

Main request - compliance with Article 84 EPC

- 2. Claim 1 of the main request clearly defines the oxygenate feedstock to comprise triglycerides. The board's clarity objections raised in its preliminary



opinion as regards the nature of the feedstock have thus been overcome.

Moreover, the brackets in claim 1 as filed (II, *supra*) have been deleted, thus meeting the board's objection that it was not clear whether the features within the brackets were optional or not.

The board's clarity objections to claims 2, 3 and 10 of the main request submitted with the letter dated 31 December 2019 have been overcome by deleting these claims.

The board concludes that the claims according to the main request meet the requirements of Article 84 EPC.

Main request - novelty under Article 54 EPC

3. The examining division found that the subject-matter of the then pending requests lacked novelty over document D3.

3.1 However, claim 1 of the present main request requires that the oxygenate feedstock comprise triglycerides. The feedstock used in the method disclosed in D3 (table 1, page 100) comprises hexadecane, pentadecane, 4-methylacetophenone, diethyldecanedioate (DES), guaiacol, H<sub>2</sub>O, CS<sub>2</sub> and 1,3-propane-diamine. Thus, no triglycerides are included in the feedstock of D3.

For this reason alone, the board concludes that the subject-matter of claim 1 of the main request is novel over D3.

3.2 No other documents were cited by the examining division against the novelty of the then pending requests. The board sees no reason to deviate from this conclusion as

regards the subject-matter of claim 1 of the present main request.

- 3.3 The board thus concludes that the subject-matter of claim 1 is novel over the cited documents D1 to D5 (Articles 52(1) and 54 EPC). By the same token, the subject-matter of the remaining claims is novel over the cited documents.

Main request - inventive step under Article 56 EPC

4. The closest prior art

The search report established for the present application contained document D1 as the sole document found. D1 was given the category "X" in the search report for all claims as filed, including claim 2 specifying the oxygenate feedstock to comprise triglycerides. This category "X" meant that the claimed invention could not be considered to be novel or to involve an inventive step when the document was taken alone.

In line with the search report, the examining division (impugned decision, points 12 to 15) indicated D1 as the closest prior art for the claimed subject-matter.

- 4.1 The board disagrees with the examining division's approach. Claim 1 according to the main request (1 *supra*) defines a method for the hydrodeoxygenation of an oxygenate feedstock comprising triglycerides. This corresponds to the general disclosure of the present application concerning the hydrodeoxygenation of an oxygenate feedstock of biological origin (page 1, lines 9 to 10, page 2, lines 29 to 31, page 3, lines 9 to 11), particularly one comprising triglycerides (page 3, line 12, page 9, line 33 to page 10, line 24). This

is confirmed by all the examples in the application, which describe the hydrodeoxygenation of a vegetable oil feedstock, namely a rapeseed oil-based feedstock (page 14, line 32, page 15, lines 20 to 21).

- 4.2 In contrast to the present application, D1 (abstract, column 1, lines 10 to 15, column 2, lines 45 to 48, claim 1) concerns the catalytic treatment of highly aromatic petroleum and coal derived liquids. The feedstock treated according to D1 (column 2, lines 48 to 50, column 6, lines 15 to 19, example 5 in column 10) contains oxygen as an impurity to be removed. Even if such feedstock might generally be seen as falling under the term "*oxygenate feedstock*" of claim 1 as filed (II, *supra*), it has a totally different origin (petroleum and coal) compared to the feedstock of biological origin disclosed in the present application, and it clearly does not contain triglycerides.

D1 is thus not suitable as the closest prior art for the subject-matter of claim 1 of the main request.

- 4.3 During the oral proceedings, the examining division introduced four further documents, namely D2 to D5.

D2 is a European patent application, the content of which is only relevant for the question of novelty pursuant to Article 54(3) EPC. This document is thus not to be considered for the question of inventive step (Article 56 EPC, second sentence).

D4 (column 2, lines 56 to 63, claim 1), relating to the catalytic hydrotreatment of hydrocarbons, and D5, concerning gasoline production, are even more remote than D1 from the technical field of the present application.

4.4 D3 (page 98, introduction) deals with the hydrodeoxygenation reactions occurring in the stabilisation or upgrading of pyrolysis oils. In particular, D3 studies the influence of water, ammonia and hydrogen sulfide on the activity of the catalysts involved in those hydrodeoxygenation reactions. The aim of D3 (page 100, last paragraph before "Experimental") is to gain information about the sensitivity of sulfided bimetallic catalysts in particular to poisons present in biomass-derived pyrolysis oils. It is concluded (page 114, last paragraph) that hydrogen sulfide and ammonia may be used for controlling the reactions occurring in the hydrotreatment of the bio-oils.

4.5 The oils referred to in D3 are derived from the pyrolysis, i.e. high-temperature treatment, of biomass such as wood or algae. Such oils do not contain triglycerides, which would anyway not withstand the high pyrolysis temperatures. Moreover, the study in D3 is conducted on a model feedstock, which, as mentioned under 3.1 above, comprises hexadecane, pentadecane, 4-methylacetophenone, diethyldecanedioate (DES), guaiacol, H<sub>2</sub>O, CS<sub>2</sub> and 1,3-propane-diamine.

4.6 Therefore, though coming to some extent closer to the subject-matter of the present application, the oxygenate feedstock used in D3 is still remote from the oxygenate feedstock comprising triglycerides defined in claim 1 at issue.

#### 5. Conclusions on inventive step

As a consequence of the above, neither the sole document D1 cited in the search report nor D2 to D5 subsequently introduced by the examining division qualify as the closest prior art.

- 5.1 Should the skilled person nevertheless start from D1 as the closest prior art, as done by the examining division in the impugned decision (4, *supra*), the board sees no reason why they would apply the method of D1 to a feedstock comprising triglycerides, i.e. a totally different feedstock compared to the one disclosed there. The examining division merely asserted that "*[t]he skilled person would at least apply the same method of D1 to a feedstock comprising a just detectable amount of triglycerides*", without giving any reason why the skilled person would do so.
- 5.2 Should the skilled person start from D3 as the most relevant among the documents cited, no indication is present in D1, D4 or D5 that would prompt the skilled person to apply the catalytic hydrotreatment disclosed in D3 to a feedstock comprising triglycerides, i.e. a totally different feedstock compared to that used in D3. In this respect, it is well known that even small variations in the composition of the feedstock may be highly detrimental to the activity of the catalysts involved.
- 5.3 On the basis of the available documents, the board thus concludes that the subject-matter of claim 1 of the main request, and of the dependent claims 2 to 8, involves an inventive step within the meaning of Article 56 EPC.

Reimbursement of the appeal fee - Rule 103(1)(a) EPC

6. The appellant requested the reimbursement of the appeal fee under Rule 103(1)(a) EPC in view of a substantial procedural violation committed, in its opinion, by the examining division.

Under Rule 103(1) (a) EPC, the appeal fee shall be reimbursed in full where the Board of Appeal deems an appeal to be allowable, if such reimbursement is equitable by reason of a substantial procedural violation.

The board notes the following as regards the examination proceedings.

- 6.1 The appellant had filed a main and an auxiliary request by letter dated 22 May 2015, i.e. more than one month before the oral proceedings before the examining division, thus meeting the final date (26 May 2015, see the summons to oral proceedings issued by the examining division on 13 February 2015) for making written submissions pursuant to Rule 116(1) EPC.
- 6.2 By telephone conversation held on 24 June 2015, i.e. two days before the oral proceedings, the first examiner informed the appellant (result of the telephone conversation held on 24 June 2015, issued on 10 August 2015, first paragraph) of the preliminary opinion of the examining division that the claimed subject-matter of both filed requests was "*not new and at least not inventive in view of the sole document D1*". No other objections were mentioned.
- 6.3 At the beginning of the oral proceedings, the examining division raised an objection of lack of clarity to both requests on file (minutes of the oral proceedings before the examining division, point 2). The appellant was thus confronted with a new objection at the beginning of the oral proceedings.
- 6.4 In response, the appellant filed a new main request and two auxiliary requests (point 4 of the minutes). After a break, the examining division introduced two new

documents (D2 and D3), stating that they were relevant for the assessment of the novelty of all pending requests (points 6 and 7 of the minutes). According to the impugned decision (page 2, point 8.1), these new documents had been found by carrying out an additional search on the day of the oral proceedings, just **before** their start. This means that the introduction of D2 and D3 was not motivated by the new claim requests filed by the appellant to overcome the lack-of-clarity objection raised **during** the oral proceedings.

In response to the introduction of D2 and D3, the appellant requested postponement of the oral proceedings (point 9 of the minutes). The examining division proposed instead preparing claim requests taking into account D2 and D3 (point 12 of the minutes).

- 6.5 After a break, the appellant filed a new main request and three auxiliary requests (point 14 of the minutes). The appellant argued, *inter alia*, that the claimed subject-matter was novel over the cited prior art (point 15 of the minutes).
- 6.6 After a break, the examining division introduced even further evidence (point 16 of the minutes). According to the impugned decision (points 18.2 to 18.3), such evidence, consisting of new documents D4 and D5, was found via an additional search done by the division during the break in the oral proceedings. This evidence was introduced to show that the catalyst disclosed in D3 was as required by claim 1 of the then pending requests.
- 6.7 From what is recorded in the minutes (points 16 and 17), the appellant was not given any time to consider these new documents D4 and D5. Rather, the chairman of

the division announced that the request for postponement was rejected and that the application was refused.

- 6.8 In the impugned decision (page 10, point 29), all requests then on file were rejected, since the subject-matter of claim 1 of each of these requests lacked novelty over D3 in the light of D4 and D5. At least for auxiliary request 3, this was the only reason for rejecting this particular request.
- 6.9 The examining division justified the introduction of D2 and D3 by their *prima facie* relevance. It justified its rejection of the appellant's request for adjournment by stating (impugned decision, page 10, points 32 and 33) that the appellant had been provided "*with enough amount of time to study the documents in order to restore at least novelty in view of D3*", and that since the appellant had not been able to restore novelty over D3, it considered that "*adjourning the oral proceedings would not help the applicant to improve the position of the present application*".
- 6.10 From what is set out above, it thus results that:
- The appellant was confronted with two new documents, D2 and D3, introduced by the examining division during the oral proceedings for the first time.
  - The appellant's request for postponement of the oral proceedings in view of this introduction of D2 and D3 was denied.
  - Upon filing amendments trying to take the disclosure of D2 and D3 into account, the appellant was confronted with two further new documents, D4



and D5, also introduced by the examining division during the oral proceedings.

- No time was given to the appellant to consider these new documents.
- Rather, the appellant's request for postponement was rejected and the application refused.

6.11 Therefore, the appellant was confronted with new objections based on new evidence during the oral proceedings. Although it is possible for an examining division to introduce new evidence even at a late stage of proceedings, in the present case the course of the examination proceedings suggests that the examining division tried to make up for the poor search carried out when the application was filed (4 to 4.2, *supra*) by performing last-minute additional searches, in an attempt to find documents more relevant than D1 for the claimed subject-matter.

Even if the introduction of the new documents D2 to D5 was justified by their *prima facie* relevance, the appellant should not have had to suffer the consequences of the Office's failure to perform a decent search at the outset. The oral proceedings should have been postponed to give the appellant the possibility to familiarise itself with the newly introduced evidence in an appropriate way.

The board regards a break during the oral proceedings as absolutely insufficient time for the appellant to react to this new evidence, e.g. by considering the new evidence introduced, contacting its client, getting instructions from it and preparing an appropriate defence. It should be noted in particular that D3 is a scientific paper of 18 pages whose complexity alone

would have justified the adjournment of the oral proceedings.

In this context, no reasoning is provided by the examining division as to why "*adjourning the oral proceedings would not help the applicant to improve the position of the present application*". Rather, this statement implies a pre-emptive negative assessment of potential submissions by the applicant in reaction to the newly introduced evidence and amounts to a preconceived or anticipatory judgement on how the case should be decided.

- 6.12 The board concludes that, by rejecting the appellant's request for postponement of the oral proceedings, the examining division did not provide the appellant with the appropriate opportunity to present its comments on the objection of lack of novelty over D3 in the light of D4 and D5.

The appellant's right to be heard on the examining division's novelty objection has thus been violated by the examining division's refusal of its request for adjournment of the oral proceedings, contrary to the requirement of Article 113(1) EPC. This amounts to a procedural violation. Since the examining division's objection is the sole reason for its refusal of auxiliary request 3, the procedural violation is the cause of the examining division's final decision to refuse the application. The procedural violation is thus a substantial one, and the reimbursement of the appeal fee pursuant to Rule 103(1)(a) EPC is equitable in view of this violation and the circumstances giving rise to it.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division with the order to grant a patent with the following claims and a description to be adapted thereto:  
  
Claims 1 to 8 of the main request dated 23 January 2020 filed during the oral proceedings.
3. The reimbursement of the appeal fee is ordered.

The Registrar:

The Chairman:



N. Maslin

M. O. Müller

Decision electronically authenticated