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Datasheet for the decision of 18 March 2021

Case Number: T 2260/16 - 3.3.06

Application Number: 08733578.2

Publication Number: 2139906

IPC: B01J31/18

Language of the proceedings: EN

Title of invention:
AMINO PHOSPHINE

Patent Proprietor:
Nova Chemicals (International) S.A.

Opponent:
Sasol Technology (Pty) Limited

Headword:
AMINO PHOSPHINE / NOVA CHEMICALS

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 2260/16 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 18 March 2021

Appellant: (Opponent)	Sasol Technology (Pty) Limited Baker Square West 33 Baker Street Rosebank 2196 (ZA)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Respondent: (Patent Proprietor)	Nova Chemicals (International) S.A. Avenue de la Gare 14 1700 Fribourg (CH)
Representative:	Mewburn Ellis LLP Aurora Building Counterslip Bristol BS1 6BX (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 27 July 2016 concerning maintenance of the European Patent No. 2139906 in amended form.**

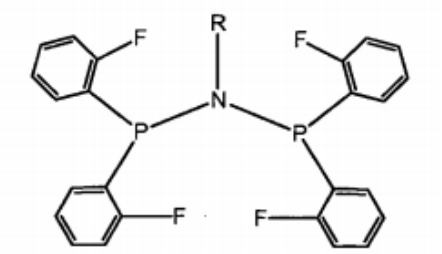
Composition of the Board:

Chairman	J.-M. Schwaller
Members:	P. Ammendola
	J. Hoppe

Summary of Facts and Submissions

I. The appeal was filed by the opponent (hereinafter "the appellant") against the interlocutory decision of the opposition division to maintain European patent Nr. 2 139 906 in amended form according to the main request filed with letter of 9 May 2016, claims 1 and 2 of which read as follows:

"*1. The molecule*

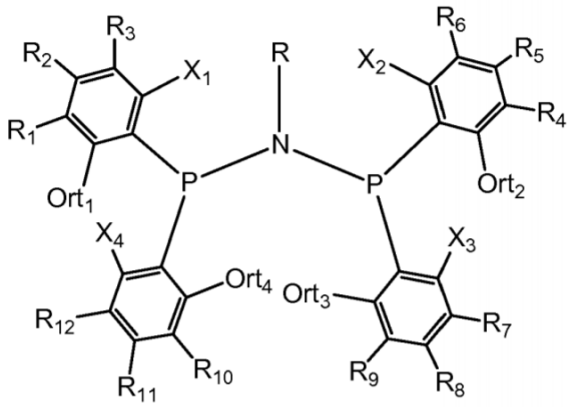


wherein R is isopropyl."

"*2. A process for the oligomerization of ethylene to a mixture comprising hexene-1 and octene-1, said process comprising contacting ethylene under oligomerization reaction conditions with a catalyst system to produce an oligomerization product comprising hexene-1 and octene-1, said catalyst system comprising:*

i) a source of chromium;

ii) a ligand defined by the formula



wherein each of X_1 to X_4 is independently selected from the group consisting of F, Br, or Cl; and each of R; ort[1] to ort[4] and R_1 to R_{12} is independently selected from the group consisting of H and non-interfering substituents; and

iii) an activator."

II. In the grounds of appeal the appellant disputed the findings of the opposition division that the subject-matter of:

- claim 2 was novel over **D1** (WO 2004/056478 A1), **D2** (WO 2004/056480 A1) and **D3** (US 2006/0293546 A1), each of which comprised a list of ligands also encompassing "(2-fluorophenyl)$_2$PN (methyl)P(2-fluorophenyl)$_2$" (hereinafter referred to as **"methyl/4(2-fluorophenyl)"**);
- claims 1 and 2 did not lack an inventive step in view of the combination of D3 with other citations.

Further it filed **D12** (J. Am. Chem. Soc., 2004, vol. 126, pages 14712-14713) and **D13** (Applied Catalysis A: General, 2006, vol. 306, pages 184-191) as well as two experimental **Annexes** 1 and 2, respectively renumbered by the board as **1c** and **2c**.

III. The patent proprietor (hereinafter "the respondent") replied with letter dated 21 April 2017 and maintained the three auxiliary requests already filed before the opposition division. Further it filed six new auxiliary requests and an experimental **Annex B**.

IV. In its preliminary opinion the board, *inter alia*, noted that the respondent had reiterated its objection of lack of enabling disclosure of the methyl/4(2-fluorophenyl) ligand in D1 but that the opposition division did not give any detailed reason justificative

of its finding of enabling disclosure of said ligand. The board further observed that the above observation in view of D1 also applied to the objection of novelty based on D2 and that it should be discussed whether the skilled reader of D3 was able or not to synthesize a compound containing said methyl/4(2-fluorophenyl) ligand.

V. The appellant made no further submission as to the substance of the case and announced that it was not going to be represented at the oral proceedings.

VI. At the oral proceedings, which were held on 18 March 2021, the final requests were established to be as follows:

The appellant requested in writing that the decision under appeal be set aside and the patent be revoked.

The respondent requested that the appeal be dismissed (main request) or, auxiliarly, that the patent be maintained based on the claims of one of the first to third auxiliary requests filed with letter of 9 May 2016, or of one of the fourth to ninth auxiliary requests filed with the reply to the grounds of appeal.

Reasons for the Decision

1. Main Request - Novelty (Article 54 EPC)

1.1 The appellant, which only disputed the novelty of claim 2 as granted, argued in essence that each of D1, D2 and D3 disclosed a process for the oligomerisation of ethylene to a mixture of hexene-1 and octene-1 by using a catalyst system comprising a source of chromium, an activator and the specific ligand methyl/4(2-

fluorophenyl). It also referred to several decisions of the boards as well as to experimental data and to allegedly relevant common general knowledge (also by making reference to D12, D13 and Annexes 1c and 2c).

1.2 In particular, in its statement of grounds of appeal the appellant stressed that the issue of whether methyl/4(2-fluorophenyl) was disclosed in an enabling manner in Dl had been debated during the oral proceedings in the opposition proceedings and that the minutes confirmed that the opposition division had considered this disclosure to be an enabling disclosure. It concluded that the relevance of Dl's disclosure of this ligand was "not in doubt".
It is also evident to the board, that the appellant implicitly assumed that this argument applied to the disclosure of methyl/4(2-fluorophenyl) in D2 and D3 as well.

1.3 With its reply the respondent reiterated the objection that the teachings of D1-D3 lacked sufficient disclosure to enable the skilled person to synthesise methyl/4(2-fluorophenyl) and stressed, while the opposition division explained that they did not need to decide on the enablement issue (under point 6 of the decision under appeal), that this latter was very relevant for the assessment of both novelty and inventiveness.

1.4 The board has drawn the attention of the parties to the possible relevance of this issue in its communication of 1 April 2020 (see V above), but since the appellant did not file any written submission as to the substance of the case in reply to the board's communication and decided not to be represented at the oral proceedings, there is on file no argument of the appellant rebutting

the respondent's submissions as to the lack in D1 to D3 of sufficient disclosure to enable the skilled person to synthesize methyl/4(2-fluorophenyl).

1.5 The board notes in this respect that, as stressed by the respondent, the synthetic route described in D1 for making the ligand, is undisputedly different from that described in the patent and even from the one used by the appellant to prepare such ligands (see Annex 2: experimental report annexed to the notice of opposition). In particular, both in the patent and in the method used by the opponent, a two-step synthetic process has been used in order to go from the bis-aryl phosphine chloride to the ligand product, via an aminophosphine intermediate. By contrast, D1 (and the same applies to D2, very similar to D1) only discloses a one-step procedure, in which the phosphine chloride is reacted with a primary amine to directly produce the ligand. The board further notes that D3 is silent as to the procedure used for obtaining the ligands mentioned therein. Furthermore no evidence could be found in any of the prior art referred to in the grounds of appeal, or in appellant's submissions during the opposition proceedings that methyl/4(2-fluorophenyl) - or any other similar ligand with four 2-halogenphenyl groups - could be prepared by anything other than the two-step procedure. The board stresses that the documents cited in the statement of grounds of appeal (including the experimental data filed for the first time therewith) do not relate at all to the question of the enablement of the disclosure of methyl/4(2-fluorophenyl) in D1, D2 or D3. Hence, they have no bearings on the above considerations.

1.6 Accordingly, it appears plausible to the board that the the skilled person reading at the respective

publication date any of D1, D2 or D3 would neither already know, nor learn from these citations how to synthesise methyl/4(2-fluorophenyl) (or any other similar ligand encompassed by the formula given in claim 2 under consideration).

1.7 It follows that, because of the lack of an enabling disclosure of the methyl/4(2-fluorophenyl) in each of D1, D2 or D3, the appellant's novelty objections - all based on the specific disclosure of this ligand - are rejected as unconvincing. The board sees therefore no reason for reversing the finding of the opposition division that the subject-matter of claim 2 is not anticipated in the prior art and, thus, also finds that the main request complies with the requirements of Article 54 EPC.

2. Main request - Inventive step (Article 56 EPC)

2.1 The appellant disputed the presence of an inventive step for the ligand of claim 1 (namely a (2-fluorophenyl)$_2$PN(isopropyl)P(2-fluoro-phenyl)$_2$, referred to hereinafter as **"isopropyl/4(2-fluorophenyl)"**) and for the process of claim 2 presenting in substance three distinct lines of reasoning.

2.1.1 In sections 3.1 and 3.2 of the grounds of appeal this party argued in essence that the common general knowledge and/or the disclosure in certain other citations would have rendered obvious for a skilled person, who started from the closest prior art disclosed in D3 in which the ligand was methyl/4(2-fluorophenyl) (and who aimed at solving either the technical problem of providing an alternative to the prior art of departure or that of increasing the total

amount of 1-hexene and 1-octene produced in an ethylene oligomerisation reaction) to replace the methyl group in the methyl/4(2-fluorophenyl) ligand by means of an isopropyl group, thereby arriving without inventive ingenuity to the ligand described in claim 1 and to its use in a process for ethylene oligomerisation as described in claim 2.

2.1.2 However, if only for the reason that the prior art of departure for the assessment of inventive step cannot plausibly be represented by a not enabled (i.e. insufficiently disclosed as explained above) embodiment of the prior art, this inventive step objection based thereupon appear to the board clearly unconvincing.

2.2 In section "3.3 Further Comments on D3" the appellant also considered as possible starting point the prior art in D3 relating to the ligand (2-methoxyphenyl)$_2$PN(methyl)P(2-methoxyphenyl)$_2$ (hereinafter **"methyl/4(2-methoxyphenyl)"**), which is used in the Examples of D3. It alleged that the specific mention of methyl/4(2-fluorophenyl) and of methyl/4(2-methoxyphenyl) in the same list of alternatives for the ligand in paragraph [0036] of D3, rendered it clear that 2-fluorophenyl and 2-methoxyphenyl were equally preferred substituents of the P atoms in the ligand of D3. Thus, it would have taken no inventive effort on the part of the skilled person to replace the ligand methyl/4(2-methoxyphenyl) employed in the Examples of D3 with the ligand recited in claim 1 under consideration. Moreover, even if the skilled person were faced with the problem of increasing the amount of 1-octene produced in the Examples of D3, the disclosure in another document (that the 1-octene selectivity can be increased by replacing the N-methyl bridging group of tetraphenyl PNP ligands with an N-isopropyl group) would have

rendered obvious to solve this problem by turning to the methyl/4(2-fluorophenyl) disclosed in D3, and readily replacing therein the methyl substituent with an isopropyl substituent.

2.2.1 It is immediately apparent to the board that also this second objection based on D3 is inevitably affected by the lack of disclosure in D3 (and/or of common general knowledge that renders non enabling the disclosure in D3) of methyl/4(2-fluorophenyl) already discussed above. As a matter of fact, even assuming, for the sake of argument in favour of the appellant, that D3 (alone or in combination with the other available documents) would suggest to replace in the examples of D3 the four (2-methoxyphenyl) groups present in the ligand used, by means of four 2-fluorophenyl groups, still the skilled reader of D3 would neither already know, nor learn from this citation (or from any of the other available prior art documents) how to synthesise any such ligands having four 2-fluorophenyl groups. Thus, the skilled person would still not know how to synthesise neither methyl/4(2-fluorophenyl), nor any other ligand with four 2-fluorophenyl groups, such as the isopropyl/4(2-fluorophenyl) of present claim 1, and/or any other ligand embraced by the formula in "ii)" of claim 2 (in which "*F, Cl or Br*" can be the four substituents "X_1", "X_2", "X_3" and "X_4"). Hence, also this inventive step objection against claims 1 and 2 did not convince the board.

2.3 Finally, in point 3.4 of its grounds of appeal the appellant started from the prior art disclosed in the examples of D1 - in which the ligand was (4-methoxyphenyl)$_2$ PN(isopropyl)P(4-methoxyphenyl)$_2$ - and submitted that experimental data on file would prove that the technical problem solved (by the process of

claim 2 under consideration) would just be the provision of an alternative oligomerisation process. Hence, the appellant argued that it would have been obvious to the skilled person to use methyl/4(2-fluorophenyl) in place of the exemplified ligand of D1 in view of the disclosure of both of these ligands on page 8 of D1. The disclosure of several other ligands in the same page would also have rendered obvious to the skilled person to replace the methyl bound to the nitrogen with a isopropyl, thereby also arriving at the ligand of claim 1 under consideration.

2.3.1 For the board this third objection implies that the skilled person should find in D1 (or should already know as part of the chemist general knowledge) enough information enabling the synthesis of methyl/4(2-fluorophenyl). Since, it has instead been established above that the skilled reader of D1 would neither already have such information, nor learn it from this citation (or from any of the other available prior art documents), also this last objection of lack of inventive step appears manifestly unconvincing.

3. It follows from the above considerations that the board sees no reason for reversing the finding of the opposition division that the subject-matter of claims 1 and 2 is not obvious in view of the prior art and thus also finds that the main request complies with the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Pinna J.-M. Schwaller

Decision electronically authenticated