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**Datasheet for the decision
of 28 January 2020**

Case Number: T 2035/13 - 3.3.02

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PESTICIDES FORMULATIONS

Patent Proprietor:
S.I.P.C.A.M. OXON S.p.A.

Opponent:
BASF SE

Headword:

Relevant legal provisions:
EPC Art. 54, 56

Keyword:

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T 1988/07

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Beschwerdekammern

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Case Number: T 2035/13 - 3.3.02

D E C I S I O N
of Technical Board of Appeal 3.3.02
of 28 January 2020

Appellant: BASF SE
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Respondent: S.I.P.C.A.M. OXON S.p.A.
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
18 July 2013 concerning maintenance of the
European Patent No. 1608220 in amended form.**

Composition of the Board:

Chairman M. O. Müller
Members: S. Bertrand
M. Blasi

Summary of Facts and Submissions

I. The appeal by the opponent (hereinafter "appellant") lies from the interlocutory decision of the opposition division that European patent No. 1 608 220 as amended, and the invention to which it relates, met the requirements of the EPC.

II. The main request held allowable by the opposition division in its decision contains a set of 13 claims, the independent claim 1 of which reads as follows:

"1. Concentrated microemulsions comprising:

- 1) 10-25 parts by weight, preferably 12-20 parts by weight, of a pesticide stable in water having a solubility in water, at 20°C, lower than 1% by weight, having a melting point from 10°C to 60°C;*
- 2) 8-25 parts by weight of one or more solvents containing oxygen atoms, having a flash point >60°C, solubility in water at 20°C lower than 5% by weight, the Hildebrand solubility parameter in the range 16-21 MPa^{1/2};*
- 3) 10-20 parts by weight, preferably 12-18 parts by weight, of a polyol soluble in water at 20°C;*
- 4) 10-25 parts by weight, preferably 12-20 parts by weight, of one or more nonionic surfactants having a HLB value (hydrophylic/lipophylic balance) from 9 to 15, preferably between 10 and 13;*
- 5) 2-10 parts by weight, preferably 4-8 parts by weight, of one or more anionic surfactants;*
- 6) 20-40 parts by weight, preferably 25-35 parts by weight, of water;*

wherein

- the sum of the amounts of the components 1), 2), 3), 4), 5), 6) is 100 parts by weight;
- the ratio by weight between the amount of solvent 2) and the active ingredient 1) ranges from 0.8:1 to 1.5:1;
- the ratio by weight between the sum of the amounts of the surfactants 4) and 5) and the amount of the crop pesticide 1) is in the range 0.5:1-3:1, preferably 1:1-2:1;
- the ratio by weight between 4) and 5) ranges from 1:1 to 4:1."

III. The following documents are referred to in the present decision:

- | | |
|-----|---|
| D4 | EP 0 533 057 A2 |
| D6 | A.F.M. Barton, "Solubility Parameters",
Chemical Reviews, volume 25(6), 1975,
pages 731 to 752 |
| D8 | EP 0 297 207 A2 |
| D22 | K. S. Nayayanan, "Pesticide Formulations
and Adjuvant Technology", chapter 8,
Macro- and Microemulsions, CRC Press,
1996, pages 156 to 163 |
| D23 | M. R. Krenek et al., "An Overview -
Solvents For Agricultural Chemicals",
pages 113, 121 and 122 |
| D27 | Safety data sheet on cyclohexanone,
June 2000 |
| D28 | Safety data sheet on acetophenone,
15 December 2011 |
| D36 | Information on Heptenophos, British Crop
Production Council, 2011 |

D39 Extract from "PhysProp Database", SRC
 Inc., North Syracuse, USA, 2013

- IV. In its decision the opposition division concluded, *inter alia*, that the claimed subject-matter was novel over D4 and D8 and inventive in view of D8 as the closest prior art.

- V. In its statement setting out the grounds of appeal, the appellant contested the reasoning of the opposition division and submitted that the subject-matter of the claims of the main request lacked novelty and inventive step in view of either of D4 and D8.

- VI. The patent proprietor (hereinafter "respondent") filed a reply to the statement of grounds of appeal. It rebutted the appellant's arguments.

- VII. Thereafter, the board issued summonses to oral proceedings, each with an annex in preparation for them. Both parties had requested oral proceedings.

- VIII. In a letter dated 6 December 2019, the respondent *inter alia* submitted further arguments concerning the patentability of the claimed invention of the main request.

- IX. Oral proceedings before the board were held on 28 January 2020. At the end of the oral proceedings, the decision of dismissing the appeal was taken.

- X. The appellant's case, where relevant to the present decision, may be summarised as follows.

Novelty

- D4 (column 4, line 1; column 5, lines 10 to 12, lines 31 to 35 and line 44; examples 3 to 5; and claims 1 and 5 to 7) disclosed a composition having the required features according to claim 1 of the main request. The ketone used as a solvent in claim 1 of D4, by reference to cyclohexanone and acetophenone, represented a generic class of solvents having a flash point of 46°C to 77°C, a solubility in water of 0.5% to 15% and a Hildebrand solubility parameter of 20.3 to 21.8 MPa^{1/2}, and corresponded to the solvent of claim 1 of the main request.

- D8 (example 25 in combination with page 8, line 41; page 9, line 19; and claim 1) disclosed a composition according to claim 1 of the main request. In particular, it was permissible to combine the teaching of the description with the preferred embodiment represented by example 25.

Inventive step

Both D4 and D8 related to the field of microemulsions and could be considered the closest prior art.

Considering D4 the closest prior art:

- The distinguishing feature of claim 1 of the main request in view of D4 was the solvent.

- The comparative examples in the patent were not conclusive since N-methylpyrrolidone was not the closest solvent of D4. Acetophenone having a

Hildebrand solubility parameter of $21.8 \text{ MPa}^{1/2}$, should have been used for the comparison. Furthermore, examples 2 and 3 showed a milky appearance, demonstrating that some of the compositions of claim 1 of the main request were not stable. Therefore, the results shown in the examples and the comparative examples had to be disregarded for formulating the objective technical problem.

- For that reason, the objective technical problem was the provision of an alternative concentrated microemulsion.

- The solution proposed by claim 1 of the main request was obvious in view of D22 (page 162, table 7) or D23 (page 121, paragraph "*Isophorone and Other Ketones*"), which taught that cyclohexanone or acetophenone could be replaced by isophorone, the latter meeting the requirements of claim 1 of the main request.

- The skilled person would have arrived at the subject-matter of claim 1 of the main request.

Considering D8 the closest prior art:

- The distinguishing feature of claim 1 of the main request in view of D8 was the solvent.

- For the same reasons as for D4, the comparative data in the examples of the patent were not conclusive and had to be disregarded for formulating the objective technical problem.

- The objective technical problem was the provision of an alternative concentrated microemulsion.
- The solution proposed by claim 1 of the main request was obvious in view of D8. D8 disclosed suitable solvents for the concentrated microemulsions described there. n-Octanol (page 8, lines 34 to 43) was proposed in D8 as a solvent for replacing the xylol used in example 25 of the document.
- It was obvious for the skilled person to arrive at the subject-matter of claim 1 of the main request.

XI. The respondent's case, where relevant to the present decision, may be summarised as follows.

Novelty

- Cyclohexanone and acetophenone, disclosed in D4, did not correspond to solvent 2) of claim 1 of the main request. The appellant had combined the different, not explicitly disclosed, parameters of cyclohexanone and acetophenone to arbitrarily generate undisclosed ranges for the Hildebrand parameter, flash point and water solubility to create a generic class of solvents having a flash point of 46°C to 77°C, a solubility in water of 0.5% to 15% and a Hildebrand solubility parameter of 20.3 to 21.8 MPa^{1/2}. However, cyclohexanone and acetophenone were two different and separate examples and, therefore, according to the established case law (T 1988/07), their features could not be combined. D4 neither explicitly nor implicitly disclosed a solvent corresponding to

ingredient 2) of claim 1 of the main request. Therefore, the subject-matter of claim 1 of the main request was novel in view of D4.

- Example 25 of D8 disclosed xylol, i.e. a compound which did not contain oxygen atoms as required by claim 1 of the main request. Furthermore, example 25 related to a specific and well-defined embodiment of the emulsion of D8, and it could not be combined with features isolated from the general part of the description (solvents listed on page 8, lines 36 to 43), in the absence of any suggestion to do so. Therefore, the subject-matter of claim 1 of the main request was novel in view of D8.

Inventive step

Considering D4 the closest prior art:

- The distinguishing feature in view of D4 was the solvent.
- In comparative example 11 of the patent, which used N-methylpyrrolidone as the solvent, no microemulsion was obtained and the formation of mixtures with a tendency to rapid phase separation was observed. This was in contrast with example 8 of the patent, which used a solvent according to claim 1 of the main request and resulted in a limpid and stable microemulsion. This showed that the Hildebrand solubility parameter and the water solubility of the solvent were essential to stabilise the concentrated microemulsion.

- The objective technical problem was to provide a microemulsion with low toxicity which was more stable.
- The skilled person would not have found any suggestion in D4 to arrive at the claimed solution. In particular, a skilled person would not have found in D4 any pointer or suggestion to use a solvent having the features required by claim 1 of the main request in order to obtain stable concentrated microemulsions of pesticides having a melting point in the range of 10°C to 60°C. Furthermore, the skilled person, following the teaching of D4, would have selected instead the appropriate emulsifiers disclosed there.
- Therefore, the subject-matter of claim 1 of the main request was inventive over D4.

Considering D8 the closest prior art:

- The distinguishing feature in view of D8 was the solvent.
- In comparative example 10 of the patent, which used biodiesel as the solvent and comparative example 11 of the patent, which used N-methylpyrrolidone as the solvent, no microemulsion was obtained and the formation of mixtures with a tendency to rapid phase separation was observed. This was in contrast with example 8, which used a solvent according to claim 1 of the main request and showed a limpid and stable microemulsion.

- The objective technical problem was to provide a microemulsion with low toxicity which was more stable.

- D8 did not teach the solvent according to claim 1 of the main request. The essential feature in D8 were the surfactant system, which was a combination of a particular non-ionic surfactant, selected from a specific class and two anionic surfactants belonging to other specific classes. In D8, the solvent in the microemulsions was optional, and no restriction was given for the choice of solvent. D8 did not prompt the skilled person to use a solvent, in particular a solvent having all the features of solvent 2) according to claim 1 of the contested patent, to obtain a stable concentrated microemulsion.

- Therefore, the subject-matter of claim 1 of the main request was inventive over D8.

XII. The parties' requests relevant for the present decision were the following:

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

- The respondent requested that the appeal be dismissed, implying that the patent be maintained in amended form as considered allowable by the opposition division.

Reasons for the Decision

1. The appeal is admissible.

Novelty - Article 54 EPC

2. Novelty in respect of document D4

2.1 Claim 1 of the main request, i.e. of the version as considered allowable by the opposition division, relates to a concentrated microemulsion comprising certain amounts and certain ratios of:

- 1) a pesticide stable in water having a solubility in water, at 20°C, lower than 1% by weight, and having a melting point from 10°C to 60°C;
- 2) one or more solvents containing oxygen atoms, having a flash point >60°C, a solubility in water at 20°C lower than 5% by weight and a Hildebrand solubility parameter in the range of 16-21 MPa^{1/2};
- 3) a polyol soluble in water at 20°C;
- 4) one or more non-ionic surfactants having an HLB value in the range of 9 to 15;
- 5) one or more anionic surfactants;
- 6) water (II, *supra*).

2.2 The appellant (X, *supra*) submitted that D4 disclosed the subject-matter of claim 1 of the main request in the combination of claims 1 and 5 to 7 with the passages of column 4, line 1; column 5, lines 10 to 12, lines 31 to 35 and line 44; and examples 3 to 5.

2.3 D4 (claim 1) discloses a microemulsion containing, *inter alia*:

- at least one herbicidally active ingredient;
- at least one emulsifier selected from the group of calcium salts of dodecylbenzene sulphonic acid,

- polyglycol esters of fatty acids, ethoxylated nonylphenols and alkanolpolyglycol ethers;
- one or more organic solvents preferably selected from the group consisting of aromatics, ketones and pyrrolidone; and
 - water.

The solvents mentioned in claim 1 of D4, i.e. aromatics, ketones and pyrrolidone, are exemplified in the paragraph of column 5, lines 40 to 47. Among those listed are cyclohexanone and acetophenone, which are both ketones. As can be deduced from D6 (page 744), D27 (pages 2 and 4) and D28 (page 5), these solvents have a Hildebrand solubility parameter of 20.3 MPa^{1/2} (cyclohexanone) and 21.8 MPa^{1/2} (acetophenone), a flash point of 46°C (cyclohexanone) and 77°C (acetophenone) and a solubility in water of 15 wt.% (cyclohexanone) and 0.55% (acetophenone). Hence, cyclohexanone has a flash point and a solubility in water of 46°C and 15 wt.% respectively, while claim 1 of the main request requires a flash point greater than 60°C and a solubility in water of lower than 5 wt.%. Acetophenone has a Hildebrand solubility parameter of 21.8 MPa^{1/2}, while claim 1 of the main request requires a Hildebrand solubility parameter of 16 MPa^{1/2} to 21 MPa^{1/2}. Consequently, cyclohexanone and acetophenone do not correspond to solvent 2) of claim 1 of the main request.

Therefore, the combination of the passages cited by the appellant does not disclose a microemulsion comprising the solvent required by claim 1 of the main request.

- 2.4 The appellant argued that the ketone used as a solvent in claim 1 of D4, by reference to cyclohexanone and acetophenone, represented a generic class of solvents

having a flash point of 46°C to 77°C, a solubility in water of 0.5% to 15% and a Hildebrand solubility parameter of 20.3 to 21.8 MPa^{1/2}.

- 2.5 The board acknowledges that the lower and upper limits of the parameter ranges constructed by the appellant correspond to the specific values of the corresponding parameter (flash point, solubility and Hildebrand parameter) of cyclohexanone and acetophenone disclosed in D4. The board also acknowledges that the ranges constructed by these parameter values of cyclohexanone and acetophenone at least partially overlap with the corresponding ranges defined in claim 1.

However, it is established case law that combining separate items belonging to different embodiments described in one and the same document is not permissible, unless such combination has specifically been pointed to (see for example T 1988/07, Reasons, 3.3). As established above (2.3, *supra*), neither cyclohexanone nor acetophenone is a solvent as defined in claim 1 of the main request. D4, in fact, neither teaches nor suggests a solvent as defined in claim 1, let alone combining the specific values regarding the flash point, solubility in water and Hildebrand solubility parameter of cyclohexanone and acetophenone so as to define ranges that restrict the generic class of solvents (ketones) to those having the parameters required by claim 1 of the main request.

Consequently, D4 does not disclose at least solvent 2) of claim 1 of the main request.

- 2.6 The subject-matter of claim 1 is thus novel in view of the disclosure of D4. As acknowledged by the appellant,

the same applied to the subject-matter of all the remaining claims.

3. Novelty in respect of document D8

3.1 Concerning D8, the appellant cited example 25 in combination with page 8, line 41, page 9, line 19 and claim 1.

3.2 Example 25 of D8 discloses a microemulsion containing:

- 25 wt.% (50% of 50%) of 7-chlorobicyclo-[3,2,0]-hepta-2,6-dien-6-yl dimethylphosphate;
- 25 wt.% (50% of 50%) of xylol;
- 10 wt.% of glycerol;
- 8.6 wt.% of tris-(alpha-methyl-benzyl)phenyl-polyglycoether containing on average 22 moles of oxyethylene units;
- 5.66 wt.% (70% of 5.8% and 1.6%) of the calcium and sodium salts of n-dodecylbenzene sulphonic acid;
- 1.74 wt.% (30% of 5.8%) of isobutanol; and
- 24 wt.% of water.

7-Chlorobicyclo-[3,2,0]-hepta-2,6-dien-6-yl dimethyl phosphate is heptenophos (D36, item "Nomenclature" on the first page), which, according to D39, has a melting point lower than 25°C and a solubility in water of 2.5 g/l, i.e. 0.25 wt.%. Heptenophos thus corresponds to pesticide 1) of claim 1 of the main request.

The ratio between the amount of xylol and heptenophos is 1, which is within the range of 0.8:1 to 1.5:1. Assuming that xylol corresponds to solvent 2) of claim 1 (which it does not, as discussed below), this ratio is as required for the ratio between solvent 2) and

pesticide 1) in claim 1 of the main request (from 0.8:1 to 1.5:1).

The glycerol corresponds to component 3) of claim 1 of the main request (polyol soluble in water at 20°C).

The tris-(alpha-methyl-benzyl)phenyl-polyglycoether corresponds to non-ionic surfactant 4) of claim 1 of the main request.

The calcium and sodium salts of n-dodecylbenzene sulphonic acid correspond to anionic surfactant 5) of claim 1 of the main request.

The ratio between the sum of the amounts of non-ionic and anionic surfactants and the amount of active ingredient is 14.26 to 25, i.e. 0.57, which is within the range of 0.5:1 to 3:1 as required by claim 1 of the main request.

The ratio between the non-ionic and anionic surfactants is 8.6/5.66, i.e. 1.52, which is within the range of 1:1 to 4:1 as required by claim 1 of the main request.

However, xylol does not correspond to solvent 2) of claim 1 of the main request. While xylol has the required solubility in water (<0.1 wt.%) and the required Hildebrand solubility (18.0 MPa^{1/2}), it does not represent a solvent containing **oxygen atoms**. Example 25 of D8 is thus not novelty-destroying for the subject-matter of claim 1 according to the main request.

3.3 According to the appellant, the passage on page 8, lines 36 to 43 of D8 taught the solvents which were used in the emulsion of the invention of D8. Line 41 of

page 8 referred to n-octanol, which had a solubility in water of 0.01 wt.%, a flash point of 82°C and a Hildebrand solubility of 20.9 MPa^{1/2}. The three parameters each had a value as required by claim 1 of the main request. The combination of example 25 with the teaching of the description, in particular page 8, line 41 referring to n-octanol, was novelty-destroying for the subject-matter of claim 1 of the main request.

- 3.4 As identified by the appellant, n-octanol is a solvent having a solubility in water of 0.01 wt.%, a flash point of 82°C and a Hildebrand solubility of 20.9 MPa^{1/2}, and corresponds to a solvent as defined in claim 1 of the main request. However, contrary to the appellant's submissions, and considering established case law (2.5, *supra*), there is no teaching in D8 to replace the solvent used in example 25 (xylol) with n-octanol, and thus no disclosure in D8 of a composition according to example 25 in which the solvent is n-octanol.
- 3.5 The subject-matter of claim 1 is thus novel in view of the disclosure of D8. As acknowledged by the appellant, the same applied to the subject-matter of all the remaining claims.

Inventive step - Article 56 EPC

4. The appellant objected that the subject-matter of the claims according to the main request did not involve an inventive step in view of either D4 or D8 as the closest prior art.

4.1 The invention

The gist of the invention lies in the provision of stable pesticide formulations comprising an agrochemical having a melting point in the range of 10°C to 60°C with reduced environmental impact and low toxicity (paragraphs [0001] and [0009] of the patent).

4.2 Closest prior art

The appellant referred to D4 and D8 as the closest prior art.

D4 (examples 3 to 5, claim 1 and the passage in column 5, lines 40 to 47) and D8 (example 25 in combination with page 8, line 41, page 9, line 19 and claim 1) disclose concentrated microemulsions comprising different ingredients, some of which correspond to the ones required by claim 1 of the main request (2.3 and 3.2, *supra*).

D4 aims to provide novel compositions which comprise herbicidally active substances in the form of concentrated microemulsions, and which are stable chemically and during application (column 1, lines 1 to 4).

D8 is concerned with the provision of concentrated microemulsions which are physically and chemically stable and contain at least one agrochemical active substance with low water solubility (claim 1 and page 5, lines 6 to 17).

Thus, in the same way as the patent, D4 and D8 are concerned with the stability of concentrated microemulsions comprising an agrochemical active substance.

Therefore, D4 and D8 will in turn be considered the closest prior art in the following conclusions.

4.3 D4 as the closest prior art

As set out above in the context of novelty (2.5, *supra*), the subject-matter of claim 1 of the main request differs from the concentrated microemulsion of D4 in the solvent. Solvent 2) as defined in claim 1 of the main request requires oxygen atoms, a flash point of $>60^{\circ}\text{C}$, a solubility in water at 20°C lower than 5% by weight and a Hildebrand solubility parameter in the range of $16\text{-}21 \text{ MPa}^{1/2}$ (4.1, *supra*).

4.4 Formulation of the technical problem

Examples 1 to 9 and 12 of the patent are according to claim 1 of the main request and show neither phase separation (examples 1 to 9, see table 2 "Microemulsion appearance") nor phytotoxicity (phytotoxicity of 0 in the table of example 12). The opposed patent also contains comparative examples 10 and 11, in which example 8 is repeated, except that, instead of the solvent according to claim 1 of the main request, biodiesel solvents (comparative example 10) having a Hildebrand solubility parameter of $14 \text{ MPa}^{1/2}$ (i.e. below the lower limit of the range defined in claim 1 of the main request) and N-methylpyrrolidone (comparative example 11) having a Hildebrand solubility parameter of $23 \text{ MPa}^{1/2}$ (i.e. above the upper limit of the range defined in claim 1 of the main request) are used. In these comparative examples, no microemulsions are obtained and a tendency to rapid phase separation is observed, while the concentrated microemulsion of example 8 remains unchanged after a first test involving storage for 7 days at 0°C and 14 days at

-5°C, and a second test involving storage for 14 days at 54°C (paragraphs [0044] and [0045]).

Comparative example 11, using N-methylpyrrolidone, a solvent which is explicitly disclosed in D4 (column 5, line 45), reflects the general teaching of D4. Hence, compared to D4, the subject-matter of claim 1 results in low phytotoxicity and greater stability against phase separation.

The objective technical problem in view of D4 is thus the provision of a concentrated microemulsion with low phytotoxicity that is more stable against phase separation.

- 4.5 The appellant submitted that N-methylpyrrolidone (Hildebrand solubility parameter of 23 MPa^{1/2}) does not represent an adequate comparative example in view of D4. In its view, the acetophenone disclosed in D4, having a Hildebrand solubility parameter of 21.6 MPa^{1/2}, would be closer to the concentrated microemulsion of claim 1 of the main request, which requires a Hildebrand solubility parameter of 16-21 MPa^{1/2}.

The board does not agree. N-methylpyrrolidone is soluble in water and also a solvent listed in D4. Besides the Hildebrand solubility parameter, water solubility of the solvent of claim 1 of the main request is presented as an essential feature of the solvent. Comparative example 11 of the patent shows that at least the Hildebrand solubility parameter and the water solubility of the solvent of claim 1 of the main request are essential parameters of the solvent in achieving the improved stability. Furthermore, the appellant has not shown that no effect would be

achieved in view of acetophenone and that no technical effect would be achieved by the distinguishing feature of the invention. Therefore, the board considers that the data presented in example 11 are to be taken into consideration for formulating the objective technical problem in view of D4.

- 4.6 The appellant also argued that not all the compositions of the examples according to claim 1 of the main request were microemulsions with an increased stability. It referred to examples 2 and 3 of the patent which exhibited a milky appearance after dilution at 5% in water (table 2 of the patent). This implied that the increased stability was not achieved over the whole scope of the claims.

The board cannot agree with this argument. "Milky" in table 2 of the patent refers to the appearance and the stability of the final aqueous composition to be applied on pests or crops, i.e. the aqueous composition obtained after dilution of the concentrated microemulsion in water (content of the concentrated microemulsion in the final composition is 5% in water); see paragraph [0043] of the patent. The milky appearance of this aqueous composition does not represent evidence that the concentrated microemulsion *per se* is not stable. On the contrary, table 2, second line shows that **all** the concentrated microemulsions of examples 1 to 9 have a limpid appearance, implying that they are stable. Therefore, the examples of the patent show that the improved stability in view of D4 is achieved by the compositions according to claim 1 of the main request.

4.7 Obviousness of the solution

The solvents referred to in D4 (column 5, lines 36 to 47) are aromatic solvents (such as toluene, xylol, high-boiling aromatic solvents, methylnaphthalene, Solvesso[®] series), ketones (cyclohexanone, acetophenone, N-methylpyrrolidone) or a mixture of the foregoing. There is however no information available in D4, in particular in column 5, as to how the stability of the microemulsion disclosed there could be improved by selecting a specific solvent. On the contrary, D4 discloses in the passage of column 2, lines 4 to 11, that "*[ü]berraschenderweise wurde nun gefunden, daß bei Verwendung von ausgewählten Emulgatoren mit den obengenannten Wirkstoffen transparente Mikroemulsionen hergestellt werden können, die auch nach längerer Lagerung sowohl in der Kälte als auch bei höheren Temperaturen physikalisch und chemisch stabil bleiben und keine Inhomogenitäten zeigen*". Thus, D4 teaches that the stability of the concentrated microemulsion disclosed there is improved by appropriately selecting the emulsifier system, i.e. by selecting a first ingredient being at least one dispersant from the class of the fatty alcohol polyoxypropylene-polyoxyethylene ethers and of the polyoxypropylene block copolymer, and a second ingredient being at least one emulsifier or wetting agent selected from the group consisting of calcium dodecylbenzenesulphonate, fatty acid polyglycol esters of ethoxylated nonylphenols and of alkanol polyglycol ethers (claim 1 of D4). Consequently, the teaching of D4 would not lead the skilled person to select a specific solvent in order to improve the stability of microemulsions.

The appellant did not argue that D4 disclosed or suggested solvents as claimed in order to improve the

stability of the concentrated microemulsions disclosed there. Its arguments in the written proceedings were only based on the assumption that the objective technical problem was merely the provision of an alternative.

Furthermore, D22 and D23, used by the appellant in the context of obviousness, do not contain any indication either that the solvents as claimed improve the stability of concentrated microemulsions as disclosed in D4.

4.8 The board therefore concludes that the subject-matter of claim 1, and by the same token of all the remaining claims of the main request, involves an inventive step in view of D4 as the closest prior art.

4.9 D8 as the closest prior art

The distinguishing feature of claim 1 of the main request in view of D8 is solvent 2) (3.3, *supra*). Since this distinguishing feature is the same as in view of D4 (4.3, *supra*), the same technical effect is achieved and the same technical problem is to be formulated, i.e. the provision of a concentrated microemulsion with low phytotoxicity that is more stable against phase separation (4.4, *supra*).

4.10 Obviousness of the solution

In D8, and in analogy with D4, the stability of the concentrated emulsion is achieved by selecting a specific emulsifier system comprising the three components a), b) and c) as defined in claim 1 of D8. In that claim, the organic solvent is optional ("**gegebenenfalls** 1 bis 30 Gew.-% mindestens eines mit

Wasser wenig mischbaren organischen Lösungsmittels", emphasis added by the board). This is confirmed by the passage on page 5, lines 6 to 17 of D8: "*Die erfindungsgemäßen Öl-in-Wasser-Emulsionen (Mikroemulsionen) zeichnen sich durch eine Reihe von Vorteilen aus:*
- **keine** oder **geringe** Mengen an organischen Lösemitteln, ..."

Therefore, D8 teaches that the amount of organic solvent is as low as possible, or that no solvent is present in the concentrated microemulsions disclosed there.

D8 (page 8, lines 34 to 43) further teaches that the optional organic solvents are: aromatic hydrocarbons (such as xylol, toluene, dimethylnaphthalene and a mixture of aromatics); chlorinated aromatic hydrocarbons (such as chlorobenzene); aliphatic hydrocarbons (gasoline and petroleum ether); halogenated aliphatic hydrocarbons (methylene chloride and chloroform); cycloaliphatic hydrocarbons (cyclohexane); alcohols (n-butanol, i-butanol, n-hexanol, iso-hexanol, n-octanol, cyclohexanol and benzyl alcohol); ketones (di-n-butyl ketone, isophorone, cyclohexanone and acetophenone); ethers (propylene glycol monomethyl ether); and esters (phthalates and propylene glycol monomethyl ether-acetate). Nowhere in D8 is it taught that the stability of the emulsion depends on a solvent having specific properties. On the contrary, as set out above, the solvent is not an essential feature of the invention of D8. This is experimentally confirmed by example 24 of this document, which does not contain any xylol as the solvent, in contrast to example 25 comprising the same ingredients and xylol. The concentrated microemulsion

of example 24 exhibits the same temperature stability as example 25 ("*-10 bis 50*").

Therefore, following the teaching of D8, the skilled person would not have selected the solvents as defined in claim 1 of the main request.

The appellant did not argue that D8 disclosed or suggested solvents as claimed in order to improve the stability of the concentrated microemulsions disclosed there. Its arguments in the written proceedings were based on the assumption that the objective technical problem was merely the provision of an alternative.

- 4.11 Based on the above considerations, the board comes to the conclusion that, with regard to the cited prior art, it would not have been obvious to the skilled person to replace the solvent of D8 so as to arrive at the composition as defined in claim 1 of the main request.

Therefore, the subject-matter of claim 1, and by the same token of all the remaining claims of the main request, involves an inventive step pursuant to Article 56 EPC in view of D8 as the closest prior art.

5. In view of the foregoing, the set of claims according to the main request meets the requirements of novelty and inventive step pursuant to Articles 54 and 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



N. Maslin

M. O. Müller

Decision electronically authenticated