

**Internal distribution code:**

- (A) [ - ] Publication in OJ
- (B) [ - ] To Chairmen and Members
- (C) [ - ] To Chairmen
- (D) [ X ] No distribution

**Datasheet for the decision  
of 15 January 2024**

**Case Number:** T 0102/22 - 3.3.09

**Application Number:** 12177364.2

**Publication Number:** 2687103

**IPC:** A23L29/10, A23L5/44, A61K47/14,  
A61K47/22, A61K47/26,  
A61K47/36, A61K9/107,  
A61K31/035, A61K31/11,  
A61K31/232, A23K20/179,  
A23L33/105, A61K31/07

**Language of the proceedings:** EN

**Title of invention:**  
Process for manufacturing an aqueous transparent oil-in-water emulsion comprising a carotenoid and emulsion produced

**Patent Proprietor:**  
BASF SE

**Opponent:**  
DSM Nutritional Products AG

**Headword:**  
Aqueous transparent oil-in-water emulsion/BASF

**Relevant legal provisions:**  
EPC Art. 54, 56, 83, 84, 123(2), 123(3)

**Keyword:**

Inventive step - (yes)

**Decisions cited:**



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

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 0102/22 - 3.3.09

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.09**  
**of 15 January 2024**

**Appellant:** BASF SE  
(Patent Proprietor) Carl-Bosch-Strasse 38  
67056 Ludwigshafen am Rhein (DE)

**Representative:** Reitstötter Kinzebach  
Patentanwälte  
Sternwartstraße 4  
81679 München (DE)

**Respondent:** DSM Nutritional Products AG  
(Opponent) Wurmisweg 576  
4303 Kaiseraugst (CH)

**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 12 October 2021  
revoking European patent No. 2687103 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman** A. Haderlein  
**Members:** C. Meiners  
N. Obrovski

## Summary of Facts and Submissions

- I. This decision concerns the appeal filed by the patent proprietor (appellant) against the decision of the opposition division to revoke the patent in suit (hereinafter "the patent").
- II. In its decision, the opposition division decided *inter alia* that the subject-matter of the main request filed during oral proceedings before the opposition division met the requirements of Article 123(2) and (3) EPC and Article 84 EPC. Moreover, that request was held to meet the requirement of sufficiency of disclosure (Article 83 EPC) and to be novel (Article 54 EPC). However, it lacked inventive step in view of document D2.
- III. As the former opponent withdrew its opposition in the opposition proceedings, it is not a party to the appeal proceedings.
- IV. The following documents are relevant to the present decision:  
  
D1 EP 2 644 041 A1  
D2 EP 0 239 086 A2  
D13 WO 2009/071289 A1  
D19 WO 2009/068432 A1
- V. In preparation for oral proceedings, the board issued a communication pursuant to Article 15(1) RPBA 2020 (hereinafter "the communication") indicating its preliminary opinion that the claim request then on file

was not allowable due to added matter (Article 123(2) EPC) and lack of clarity (Article 84 EPC).

VI. With a letter dated 6 November 2023, the patent proprietor filed a revised set of claims, replacing the set of claims filed with the statement of grounds of appeal.

VII. In a telephone conversation, the board informed the patent proprietor's representative that the claim request dated 6 November 2023 did not meet the requirement of inventive step in view of document D2.

With a letter dated 20 November 2023, the patent proprietor filed an amended set of claims and an adapted description.

VIII. Subsequently, the board cancelled the summons to oral proceedings.

IX. Independent claims of the sole claim request

Claim 1 of the sole request reads as follows:

"Process for manufacturing an aqueous transparent oil-in-water emulsion comprising an emulsified carotenoid, whereby the carotenoid is present in the droplets and solved in the oil, with an oil droplets size measured as z-average size with dynamic light scattering of 100-150 nm consisting of the following steps:  
a) manufacturing a solution comprising modified starch in a concentration of 0,7 - 70 %, sodium ascorbate in a concentration of 0,001 - 10 %, at least one sugar in a concentration of 0,001 -80 % and water,

wherein the solution is obtained by dissolving the components modified starch, sodium ascorbate and the at least one sugar in water,

b) manufacturing a solution by mixing at least one carotenoid in a concentration of 0,1 - 15 %, adding tocopherol in a concentration of 0,001 - 10 %, in triacylglycerol oil in a concentration of 1 - 30 % and melting the dispersed carotenoid at a temperature of 100- 200°C,

c) introducing the solution of step b) into solution of step a),

d) performing at least one step of pre-emulsification by passing the mixture of step c) through a rotator/stator mixer,

e) performing at least one step, preferably two steps of high pressure homogenization,

f) spray drying the emulsion of step e) to obtain a powder,

g-1) manufacturing an emulsion by introducing the powder of step f) in water, whereby the percent are weight percent referring to the emulsion of step c) to e)."

Claim 7 reads as follows:

"Process for manufacturing an oil-in-water stock-emulsion comprising an emulsified carotenoid, whereby the carotenoid is present in the droplets and solved in the oil, with an oil droplets size measured as z-average size with dynamic light scattering of 100-150 nm consisting of the following steps:

a) manufacturing a solution comprising modified starch in a concentration of 0,7 - 70 %, sodium ascorbate in a concentration of 0,001 - 10 %, at least one sugar in a concentration of 0,001 - 80 % and water,

wherein the solution is obtained by dissolving the components modified starch, sodium ascorbate and the at least one sugar in water,

b) manufacturing a solution by mixing at least one carotenoid in a concentration of 0,1 - 15 %, preferably 0.5 - 5 %, more preferably 0.5 - 3 %, especially 1 - 2 %, adding tocopherol in a concentration of 0,001 - 5 %, in triacylglycerol oil in a concentration of 1 - 30 %, and melting the dispersed carotenoid at a temperature of 100 - 200°C,

c) introducing the solution of step b) into solution of step a),

d) performing at least one step of pre-emulsification by passing the mixture of step c) through a rotator/stator mixer,

e) performing at least one step, preferably two steps of high pressure homogenization,

whereby the percent are weight percent referring to the emulsion of step c) to e);

f) spray drying the emulsion of step e) to obtain a powder,

g-2) manufacturing an emulsion by introducing the powder of step f) in water in a concentration of 10% - 70%, whereby the percent are weight percent referring to the concentration of the powder according to step f) in water."

Claim 8 reads as follows:

"An aqueous transparent oil-in-water emulsion produced according to a process of claim 1."

Claim 11 reads as follows:

"The powder according to step f) of claim 1 or 7."

Claim 12 reads as follows:

"The oil-in-water emulsion according to step g-2) of claim 7."

Claim 13 reads as follows:

"Use of the aqueous emulsion of claim 12 or the powder of claim 11 as colorant, preferably natural or nature identical colorant in food, feed, pharmaceutical preparations, cosmetic and/or dermal products and/or as replacement for azo dyes."

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

The claimed subject-matter overcame the objections raised by the board in its communication and also involved an inventive step in view of document D2 as the closest prior art. *Inter alia*, document D2 taught against omitting ascorbyl palmitate in the preparation of the emulsified carotenoid emulsions. It followed from the comparative examples of D2 that this component was essential for achieving transparent emulsions. The comparative emulsions lacking ascorbyl palmitate also showed a broad particle size distribution. Therefore the claimed powders derived from these emulsions and the use of the emulsions and powders as a colourant also involved an inventive step.

- XI. Final requests

The appellant requested that the opposition division's decision be set aside and that the patent be maintained on the basis of the sole claim request and the description adapted thereto, both filed with the letter dated 20 November 2023.

## **Reasons for the Decision**

### *1. Amendments (Article 123(2) and (3) EPC)*

1.1 Claims 1 and 7 are supported by the original claim 12 and page 7, line 25 to page 8, line 14 of the description as filed and the original claim 13, respectively.

The limitation of claims 1 and 7 to steps a) to g) is in line with the teaching of the examples disclosed in the application as filed.

Moreover, step a) has been reformulated based on page 12, lines 16 to 17, and is also inherent in manufacturing a solution in water of the components as recited in step a) of claims 12 and 13 as filed (on which claims 1 and 7 respectively are based). The mixing of the components is implicit in order to form a solution therefrom. The composition of the solution in step a) is also derivable from page 7, lines 27 to 31 and page 10, lines 8 to 12 as filed. The step of "adding" the at least one water-soluble antioxidant (sodium ascorbate) is merely optional in the original claims 12/13 and granted claims 1 and 10. The addition of said component is also implicit in order to provide the solution.

1.2 The remaining amendments in claim 1 are derivable from: page 1, lines 5 to 6 of the description as filed; page 3, lines 4 to 6; page 3, line 29 to page 4, line 3; page 5, lines 24 to 25 ("tocopherol" as a general expression for any tocopherol, see also examples); and

page 7, lines 17 and 18 ("sodium ascorbate", see also examples).

The remaining amendments in claim 7 are based on: page 10, lines 27 to 29 of the description as filed ("stock emulsion"); page 3, lines 4 to 6; page 3, line 29 to page 4, line 3; page 5, lines 24 to 25 ("tocopherol" as a general expression for any tocopherol); and page 7, lines 17 and 18 ("sodium ascorbate"). Similarly, all the examples of the application disclose the combination of "tocopherol" and "sodium ascorbate" as an antioxidant combination.

- 1.3 Similar considerations apply to independent claim 8, directed to the product of the process of independent claim 1.
- 1.4 Independent claim 11 results from claim 15 as filed (see also page 10, lines 28 to 29 of the original description).
- 1.5 Independent claim 12 is based on the original claim 16, whereas independent claim 13 finds its basis in the originally-filed claims 17 and 18 (see also page 2, lines 19 to 21 of the description as filed).
- 1.6 The opposition division's remarks made in its decision as to the compliance of claims 2 to 6 with Article 123(2) EPC are endorsed by the board and apply *mutatis mutandis* to claims 2 to 6 of the sole request on file. Claim 9 finds a basis in the original claims 1 and 12. Claim 10 is derived from the feature combination of the original claims 3 and 4 (see also page 3, lines 14 to 15 and page 4, lines 15 to 16 of the description as filed).

1.7 The amended claims are limited in scope compared with the granted claims. The limitations in claims 1 and 7 concern: the restriction of the oil droplets sizes to 100 to 150 nm; the restriction of the water-soluble antioxidant to sodium ascorbate and of the oil-soluble antioxidant to tocopherol (both formerly optional components); and the restriction to steps a) to g) in the process. As stated above, the mixing of the components in step a) in claims 1 and 7 is implicit. Likewise, it is implicit that sodium ascorbate has been added (only an optional feature in granted claims 1 and 10) to provide the solution of claims 1 and 7 in step a). Consequently, the scope of claims 1 and 10 as granted is broader than that of claims 1 and 7. The remaining independent claims 8 and 11 to 13 refer to claim 1 and/or claim 7. Thus no extension of the scope of protection has taken place over the granted claims either.

1.8 The requirements of Article 123(2) and (3) EPC are thus complied with.

2. *Clarity, sufficiency of disclosure and novelty*

2.1 The amendments to the granted claims, to be examined as to their compliance with the requirements of Article 84 EPC, are clear, concise and supported by the description. The sole request on file thus also meets the requirements of Article 84 EPC.

2.2 The board concurs with the opposition division's positive assessment on sufficiency of disclosure and novelty in respect of the former main request, equally applying to the subject-matter of the claims of the sole request on file in the appeal proceedings. In particular, as to novelty, document D1 does not

directly and unambiguously disclose the feature combination "sodium ascorbate", "tocopherol" and "triacylglycerol oil" in a single embodiment/ composition (see Tables 1-1 and 1-2 of D1 and the corresponding remarks under point 3 of the decision under appeal).

3. *Inventive step (Article 56 EPC)*

3.1 The patent relates to a process of manufacturing aqueous transparent oil-in-water emulsions comprising a carotenoid, and to emulsions produced by that process. Such emulsions can be used as a colourant in e.g. food, feed and pharmaceutical preparations and substitute azo dyes (see paragraphs [0001] and [0006] of the patent).

3.2 Document D2 was considered to represent the closest prior art in the decision under appeal. In particular, Example 2 of D2 served as a starting point for assessing inventive step. The board sees no reason to deviate from this assessment since D2 is also concerned with the provision of aqueous stable carotenoid emulsions.

3.3 Distinguishing feature

The processes of claims 1 and 7 differ from that in Example 2 of D2 at least in the use of sodium ascorbate.

3.4 Technical effect and objective technical problem

3.4.1 There are no comparative examples on file that would demonstrate the effect(s) that would be causally ascribable to this distinguishing feature.

3.4.2 The board concludes that the corresponding objective technical problem is to provide *alternative* aqueous transparent oil-in-water emulsions comprising an emulsified carotenoid.

3.4.3 There is no information at hand that the aforementioned objective technical problem would not have been solved across the full scope claimed, nor is this likely.

3.5 Obviousness

3.5.1 In order to assess whether it was obvious to arrive at the claimed subject-matter, the following observations concerning claim construction should be borne in mind.

Step a) in claim 1 makes it clear that the solution is *obtained* by dissolving the components explicitly mentioned in water. Step a) mentions sodium ascorbate as the *water-soluble* antioxidant to be employed. It does *not* contain a long-chain fatty acid ester of ascorbic acid, used in the preparation of the aqueous phase of the emulsions in D2.

Similarly, step b) of claim 1 and 7 explicitly recites the ingredients to be mixed ("manufacturing a solution by mixing ..."). This is also reflected by the description on file and the examples. Consequently, the addition of a long-chain fatty acid ester of ascorbic acid in steps a) and/or b) or in any other step c) to g) of claims 1 and 7 of the sole request is excluded by the scope of the claims.

3.5.2 Starting from e.g. Example 2 of D2, the skilled person would not *realistically* be prompted to add the water-soluble antioxidant sodium ascorbate to the aqueous phase of the emulsion as a replacement for ascorbyl

palmitate and lecithin to arrive at an emulsion falling within the scope of claims 1 and 7. By contrast, D2 teaches that the addition of a long-chain fatty acid ester of ascorbic acid is essential to obtain an intense colour hue and a low level of turbidity (see comparison with Comparative Examples 1 and 2 provided in D2). This modification would go against the core teaching of D2. There is thus no motivation to adduce secondary sources of information such as documents D13 or D19, cited in point 4.5 of the reasons for the decision under appeal. Consequently, the subject-matter of claims 1 and 7 involves an inventive step and meets the requirement of Article 56 EPC.

3.5.3 Independent claims 8 and 11 to 13 involve the emulsions produced according to the process of claim 1 or step g-2 of claim 7, or powders obtained by spray drying the emulsions of step e) of claims 1 or 7, which are also non-obvious for the reasons indicated above.

3.5.4 Thus the sole request meets the requirement of Article 56 EPC.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:

#### Claims:

No. 1 to 13 in accordance with the request filed with the letter dated 20 November 2023;

#### Description:

pages 1 to 11, filed with the letter dated 20 November 2023.

The Registrar:

The Chairman:



D. Hampe

A. Haderlein

Decision electronically authenticated