

Examiners' Report - Paper B (Chemistry)

This paper deals with powdery detergent compositions containing a sodium percarbonate bleaching agent.

Sodium percarbonate tends to decompose in the presence of moisture and at temperatures exceeding 28 °C. The storage stability of said percarbonate is improved by blending or coating it with alkali metal salts of certain carboxylic acids. These acids are aliphatic monocarboxylic acids, aliphatic dicarboxylic acids and hydroxycarboxylic acids.

Original claim 1 was directed to a powdery zeolite based detergent containing sodium percarbonate, a surfactant, a zeolite and at least 1 % by weight of the percarbonate of alkali metal salts of carboxylic acids, where the carboxylic acids are selected from (1) monocarboxylic acids of the formula $\text{CH}_3(\text{CH}_2)_n\text{COOH}$, wherein n is at least 2, (2) dicarboxylic acids of the formula $\text{HOOC}(\text{CH}_2)_m\text{COOH}$, wherein m is from 2 to 12, and (3) hydroxycarboxylic acids.

Document 1 (D1) discloses such powdery detergent compositions in which the sodium percarbonate is stabilised by blending or coating it with alkali metal salts of aliphatic monocarboxylic acids or of aliphatic dicarboxylic acids. D1 does not mention alkali metal salts of hydroxycarboxylic acids.

In order to overcome the novelty objection in view of D1 it was expected that the candidates restrict the alkali metal salts to those of hydroxycarboxylic acids.

Document 2 (D2) discloses a powdery detergent compositions containing sodium percarbonate. D2 teaches the addition of an alkali metal salt of a hydroxycarboxylic acid (i.e. sodium citrate) in order to reduce incrustation build up. D2 also mentions that sodium percarbonate may be stabilised by coating it with a mixture of boric acid and an alkali silicate. D2 does not disclose coating the percarbonate with sodium citrate nor that sodium citrate stabilises the percarbonate.

The Claims

1. The most elegant way of overcoming the novelty objection in view of D2 was to exclude sodium citrate for the case that the hydroxycarboxylic acid was simply blended with the other ingredients.

1.a) Another acceptable though less preferred way for rendering the subject-matter of the claim novel was to restrict the composition to one wherein the sodium percarbonate is coated with the alkali metal salt of a hydroxycarboxylic acid.

Further independent claims could be directed to

2. The use of an alkali metal salt of a hydroxycarboxylic acid for stabilising sodium percarbonate (which corresponds to original claim 5); and to

3. A sodium percarbonate bleaching agent coated with at least 1 % by weight of the percarbonate of an alkali metal salt of hydroxycarboxylic acid (which corresponds to original claim 6).

As usual, only a very limited number of marks could be gained by drafting dependent claims in paper B.

A maximum of 45 marks were awarded for the claims.

Many candidates did not realise that butanedicarboxylic acid (the compound which provided the best stabilising effect in the patent application) was known from D1 (see lines 15 and 16 on page 1 of the English version, where $m = 2$ is disclosed see T181/82). Claims directed to the use of hexanedioic acid ($m = 4$) were considered to lack an inventive step.

The Arguments

A maximum of 55 marks were awarded for the arguments.

Basis for the amendments / Art. 123 (2) EPC

Candidates were expected to indicate the basis of each and every feature of the amended claims as well as new combinations of features in these claims in the application as filed. The basis for most of the amendments could be found in the original claims. It was not necessary to refer to the examples to provide a basis for any amendment.

The basis for excluding sodium citrate was found in the application e.g. in claims 3 and 4 where blending sodium percarbonate with sodium citrate is explicitly disclosed. The decisions G1/03 and G2/03 were not relevant since these decisions relate to undisclosed disclaimers.

Novelty

The candidates should have discussed novelty by summarising the disclosures of D1 and D2 and defining the distinguishing feature(s) of the claims over the prior art.

Inventive step

When discussing inventive step, candidates should have argued why a certain document was considered to represent the closest prior art. Document D1 was deemed to be the closest prior art as it relates to the stabilisation of sodium percarbonate with alkali metal salts of carboxylic acids in zeolite based detergent compositions.

Candidates were then expected to present the objective problem solved in view of the closest prior art.

Table 2 on page 8 of the paper showed that sodium salts of hydroxycarboxylic acids stabilised sodium percarbonate when blended therewith and especially when the sodium percarbonate was coated with such salts, although salts of dicarboxylic acids such as those of butanedioic acid and hexanedioic acid were more effective. The results obtained in document D1 were not comparable to those quoted in the patent application since they were obtained under different conditions.

So, the problem solved by the subject-matter of the expected claims in view of D1 was to provide alternative zeolite based detergent compositions containing stabilised sodium percarbonate.

Document D1 leads away from the use of alkali salts of hydroxycarboxylic acids as it believes the stabilising effect to be due to the presence of unsubstituted alkyl or alkylene groups in the carboxylic acids (see the last sentence of D1). In hydroxycarboxylic acids, however, the alkyl or alkylene groups are substituted with at least one hydroxyl group.

Document D2 does not suggest the stabilisation of the percarbonate by means of said salts of hydroxycarboxylic acids as

- D2 teaches the stabilisation of the percarbonate by coating it with an aqueous solution of boric acid and alkali metal silicate (see the last sentence of the first para. on page 2 of D2), and
- D2 only discloses adding sodium citrate as a co-builder or in order to reduce incrustation build up (see the third paragraph of D2).

A number of candidates filed their answer on templates, which they had clearly prepared before the examination. It is pointed out that the submission of pre-prepared materials as part of the answer paper is contrary to the Regulations (see "Instructions to candidates concerning the conduct of the examination", paragraphs 4. and 5.7, published in Supplement to Official Journal 12/2004). Such materials will be disregarded for marking.