
Examiners' Report - Paper A 2006 (Chemistry)

The paper concerns compositions and processes for removing limescale using acidic solutions based on a protonic acid having an acid strength pK_a of 3 or more (such as citric or tartaric acid). Document 1 describes processes for removing limescale using an aqueous solution of citric or tartaric acid. The solution used does not contain any further components. Document 2 discloses a composition containing a protonic acid having a pK_a of 3 or more and a water-soluble salt of Fe^{3+} as well as the use of this composition for tanning leather. This document does not mention limescale removal.

The applicant's letter states that an aqueous solution of citric acid dissolves limescale only slowly accompanied by the formation of cloudy solutions and secondary precipitation (see page 2, 3rd paragraph). Stronger acids lead to corrosion.

These problems are overcome by descaling using a mixture the protonic acid and a water-soluble salt of a trivalent cation of a metal or of a divalent cation of a transition metal.

Independent claims:

Candidates are expected to draft the following independent method claim:

A method for dissolving limescale deposits from surfaces by treating the limescale deposit with an aqueous solution containing a protonic acid having an acid strength pK_a of 3 or more and a water-soluble salt of a trivalent cation of a metal or of a divalent cation of a transition metal, provided that the water-soluble salt is an aluminium salt in case the surface is an aluminium surface.

Candidates who do not include the proviso that the water-soluble salt is an aluminium salt when aluminium surfaces are descaled lose points. The applicant's letter (page 4, 3rd paragraph) makes it clear that this proviso is essential. Marks are also deducted for process claims limited to the descaling of domestic appliances and apparatus. It is also not necessary in the method claim to exclude the use of the composition known from document 2, candidates who do so have points deducted.

An acceptable alternative to the method claim is a use claim containing the same limitations. Candidates often file the expected independent method (or use) claim and further unnecessary independent method (or use) claims of different scope. This is contrary to Rule 29(2) EPC. These candidates are not able to obtain the full number of marks available.

The candidates were also expected to draft independent composition claims. It is necessary to exclude the subject-matter disclosed in document 2 from the composition claimed. The best scope of protection is obtained by drafting the following two independent claims to two alternative compositions.

A composition containing

- (a) a protonic acid having an acid strength pK_a of 3 or more,
- (b) a water-soluble salt of a trivalent cation of a metal or of a divalent cation of a transition metal, and (c) an acid-base indicator.

A composition containing

- (a) a protonic acid having an acid strength pK_a of 3 or more,
- (b) a water-soluble salt of a trivalent cation of a metal or of a divalent cation of a transition metal, except water-soluble salts of Fe^{3+} .

In the first alternative the composition differs from that known from document 2 by the acid-base indicator. In the second alternative composition claim the Fe^{3+} salts used in document 2 are excluded.

It is not necessary to specify that either composition is for use in a descaling process or to claim solutions rather than compositions. Candidates who do so lose marks.

A number of candidates submit claims in which the water-soluble salts are limited to those of a divalent cation of a transition metal or to those of a divalent cation of a transition metal and Al^{3+} or Cr^{3+} salts. These claims provide less protection than the preferred composition claims and receive fewer marks. A claim in which $FeCl_3$ is excluded (rather than water-soluble salts of Fe^{3+}) is not novel with respect to document 2.

72 marks are available for the independent claims.

Dependent claims:

Suitable dependent claims include claims directed to the use of a di- or tricarboxylic acid and in particular citric or tartaric acids; the use of the water-soluble salts selected from the acetates, chlorides or nitrates of Cu^{2+} , Ni^{2+} , Zn^{2+} , Fe^{3+} , Cr^{3+} and Al^{3+} ; particularly Zn^{2+} or Fe^{3+} salts and in particular $ZnCl_2$ and $FeCl_3$. The mole ratio of acid to salt of 8:1 - 1:1 could also be claimed. Dependent claims could also be formulated to a method where the aqueous solution contains: an acid-base indicator in particular methyl red or methyl orange and a method where the aqueous solution is treated with ultrasound while in contact with the limescale deposit.

13 points are available for the dependent claims. As usual candidates who file an abundance of dependent claims (shot-gun approach) which do not provide good fallback positions can generally not gain all the marks reserved for the dependent claims.

Description:

Candidates are expected to include a short summary of documents 1 and 2 in the description. The description should also make clear which features of the claims presented differed from the process and compositions known from documents 1 and 2. The problem solved by the claimed subject-matter (see page 2, final paragraph) should also be clearly presented. Candidates are not however expected to include the full argumentation that would be expected in response to an official communication. The description is also expected to comply with the requirements of Rule 27 EPC. 15 marks were available for the description.

General Remarks:

Good candidates generally did not submit notes to the examiner. Time preparing notes was often time not well spent.

EXAMINATION COMMITTEE I

Candidate No.

Paper A (Chemistry) 2006 - Schedule of marks

Category	Maximum possible	Marks awarded	
		Marker	Marker
Independent claims	72		
Dependent claims	13		
Description	15		
Total	100		

Sub-Committee for Chemistry agrees on marks and recommends the following grade to the Examination Board:

☐ PASS
(50-100)

☐ FAIL
(0-49)
COMPENSABLE FAIL
(45-49, in case the candidate sits
the examination for the first time)

30 June 2006

Chairman of Examination Committee I