Examiners' Report on Paper A (Chemistry)

The paper presented to the candidates described a filter device which can be used for the treatment of water to render it potable. Said device comprised a biofilm of exo-polysaccharide producing, gram negative bacteria supported on a water-permeable support material which is non-toxic to microorganisms and to human beings, is resistant to temperatures within a certain range, and is not readily biodegradable.

Document **DI** described the same support material which during a water treatment process became coated with a biofilm of the same type of bacteria. Document **DII** disclosed a process by means of which the time needed for the biofilm to generate in a bioreactor such as that described in **DI** could be shortened. A filter device was made by pretreating a support with the biofilm. This device was frozen until needed for use for water treatment.

The paper stated that the device could be freeze-dried and stored until use, e.g. sealed in a water-vapour impermeable material. The closest prior art for this aspect of the paper was document **DII**. The problem solved by the freeze-dried device in view of document **DII** was to provide a device which combined the fast reactivation of the frozen product of **DII** with less demanding storage requirements and was thus especially useful for purifying water in emergency situations. The paper demonstrated that it was possible to reactivate the freeze-dried device at least as quickly as the frozen-device disclosed in document **DII.** It was also clear that a freeze-dried device is easier to store than a frozen device, notably since it is not necessary to keep a freeze-dried device frozen.

Claims were expected for

- the freeze dried filter device,
- a process for making it,
- a process for reactivating the freeze-dried device and
- a process comprising the steps of reactivating the device and the purification of water with the reactivated device.

There was also room for a divisional application for the vertical arrangement of multiple filters as described in figures 3 and 4 which allowed for easy replacement of single filters. The advantage of this vertical arrangement did not require the use of a freeze-dried device for its achievement.

Several candidates introduced features into the claims which were not described as being mandatory and which were not necessary in order to achieve the claimed effect (e.g. vacuum packaging of the device; a neither highly polished nor smooth surface of the support). These candidates gained less marks.

Some candidates, in turn, did not characterise the bacteria by their essential feature or even generalised (e.g. by replacing "bacteria" by "microorganisms"). They lost marks

A number of candidates filed a large number of independent claims characterised by features for which there was no evidence in the paper that they solve a problem. These claims did not define inventive subject-matter and consequently marks were lost. For example many candidates presented independent claims directed to the conditions for the culture of the bacteria exemplified in the paper. There was no suggestion in the paper that these conditions solved a particular problem and in addition it was stated in the penultimate paragraph of the client's letter that the bacteria and their use were known. It should have been obvious to the candidates that a claim directed to the culture conditions could not involve an inventive step.

In the description quite a lot of candidates restricted their identification of the invention to a reference to the claims. As a consequence it was often quite difficult to assess which features of the claims the candidate deemed to be novel and inventive, especially as the same candidates often restricted their description to a verbatim repetition of the contents of the prior art and did not indicate what problem was solved in light of the prior art.

Paper A (Chemistry) 2000 - Schedule of marks

Category	Maximum possible	Marks awarded		Marking by further examiners if any	
		Marker	Marker	Marker	Marker .....
Independent claims	65				
Dependent claims	15				
Description	20				
Total	100				

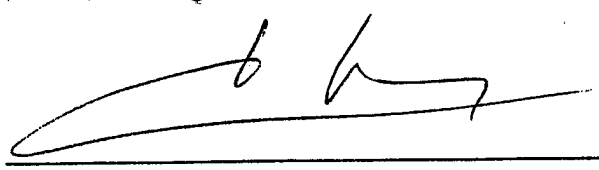
Sub-Committee for Chemistry agrees on .....marks and recommends the following grade to the Examination Board:

☐ PASS
(50-100)

☐ FAIL
(0-49)

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

Berlin, 18 August 2000



J. Combeau - Chairman of Examination Committee I