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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A GLUTARALDEHYDE COMPOSITION

(57) Abstract: This invention provides stable aqueous glutaraldehyde solution comprising 0.005% to 45% m/v solution of glutaraldehyde, an alcohol ethoxylate non-ionic surfactant, sodium acetate trihydrate and sufficient of a pH modifier to bring the pH of the solution to 6.0 to 8.5. In particular, the invention relates to stable concentrate solutions comprising 10% to 45% m/v glutaraldehyde. These stable solutions can be stored for a period of at least six months without the glutaraldehyde polymerising or the pH dropping below 5.0.



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A GLUTARALDEHYDE COMPOSITION

BACKGROUND OF THE INVENTION

THIS invention relates to a glutaraldehyde composition.

Glutaraldehyde in solution is well known as either a cleaning, disinfecting or sterilizing agent. It has been shown to be a powerful external bactericidal, fungicidal and virucidal agent. For glutaraldehyde to be effective as such, however, the pH of the glutaraldehyde solution must be in the range of 7 to 8.5. It is difficult to maintain glutaraldehyde solutions at this pH as they are unstable.

South African patent no. 93/0662 discloses an aqueous glutaraldehyde solution which comprises 4 to 6% m/v of glutaraldehyde; 19 to 21% m/v nonylphenyl ethoxylate, sufficient of a pH modifier to bring the pH of the solution to 6 to 7.5 and sodium acetate trihydrate in an amount that, with the nonylphenyl ethoxylate, serves to buffer the solution at the specified pH range. Such solutions have been found to be stable for a period of up to six months.

It is an object of this invention to provide a new aqueous glutaraldehyde solution.

SUMMARY OF THE INVENTION

According to the invention a stable aqueous glutaraldehyde solution comprises:

a 0.005% to 45% m/v solution of glutaraldehyde ($\text{OCH}(\text{CH}_2)_3\text{CHO}$);
an alcohol ethoxylate non-ionic surfactant;
sodium acetate trihydrate ($\text{NaC}_2\text{H}_3\text{O}_2$); and
sufficient amount of a pH modifier to bring the pH of the solution to 6.0 to 8.5.

By "stable" in relation to the concentrate of the invention, it is meant that the concentrate can be stored for a period of at least six months without the glutaraldehyde polymerising or the pH dropping below 5.0.

A concentrate solution typically comprises 10% to 45% m/v glutaraldehyde and as much sodium acetate trihydrate as is required to buffer the pH of the solution at 6.0 to 8.5, typically about 0.05 to 0.5% m/v of sodium acetate trihydrate.

Preferably, the solution contains sufficient pH modifier to bring its pH to 7.5.

The alcohol ethoxylate non-ionic surfactant, for example Tergitol-15S9, is typically at a pH of 8.0 to 9.0, and together with the sodium acetate trihydrate, functions as a buffer to maintain the aqueous solution of the invention at the pH of 6 to 8.5. Typically, the alcohol ethoxylate non-ionic surfactant makes up from 0.6 to 25% m/v of the solution. This surfactant is chemically bound to the glutaraldehyde and stabilizes the glutaraldehyde in a more effective linear configuration.

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The pH modifier may be a base, for example it may be a dilute aqueous solution of sodium hydroxide (NaOH). It is preferably a 1M aqueous NaOH solution.

The solution may also contain a quaternary ammonium compound (QAC), preferably a twin chain quaternary ammonium compound. Advantageously, the twin chain quaternary compound makes up from 0,1% to 15% m/v of the solution.

A concentrate solution of the invention may be diluted to produce an aqueous sterilising, cleaning, disinfecting, antiseptic, subcutaneous injectable or preservative end use composition, having pH of 5 to 8.5.

Typically, these compositions are formed by diluting a concentrate solution of the invention with sterile or potable water having a pH of 6 to 8.5 to provide a composition of reduced glutaraldehyde concentration.

Preferably, the concentration of glutaraldehyde in these diluted end use compositions is in the range of 0.005% to 5% m/v.

According to another aspect of the invention there is provided a method of producing any one of the stable aqueous glutaraldehyde solutions mentioned above, the method including the steps of:

- a) heating water to a temperature between 45°C to 50°C;
- b) adding an alcohol ethoxylate non-ionic surfactant to the water while maintaining the temperature of the solution so formed between 45°C to 50°C;
- c) adding a glutaraldehyde solution to the solution;

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- d) maintaining the temperature of the solution at 45°C to 50°C for a period of 15 to 30 minutes to allow the glutaraldehyde to cross-link with the alcohol ethoxylate non-ionic surfactant;
- e) optionally adding other active ingredients to the solution and decreasing the temperature of the solution by adding water to the solution;
- f) adjusting the pH of the solution to 7.5 to 8.5 using a pH modifier; and
- g) adding sodium acetate trihydrate to the solution to buffer the solution to a pH of 6.0 to 8.5.

The invention also covers a stabilised glutaraldehyde composition having an ESI-HPLC-MS spectrum where the spectral detail is populated in the high mass range (from just below 500 m/z to approximately 900 m/z) of the spectrum, typically a spectral detail substantially the same as that shown in Figure 4 having a parabolic profile with a homologous series 44 m/z ($-\text{CH}_2-\text{CH}_2-$).

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an ESI-HPLC-MS spectrum of glutaraldehyde for use in a stabilised glutaraldehyde composition of the invention;

Figure 2 is an ESI-HPLC-MS spectrum of an alcohol ethoxylated non-ionic surfactant for use in a stabilised glutaraldehyde composition of the invention;

Figure 3 is an ESI-HPLC-MS spectrum of buffer chemicals (including sodium acetate trihydrate and sodium hydroxide) for use in a stabilised glutaraldehyde composition of the invention; and

Figure 4 is a an ESI-HPLC-MS spectrum of a stabilised glutaraldehyde composition of the invention.

DESCRIPTION OF EMBODIMENTS

The inventor has now developed a new stable concentrate glutaraldehyde solution using a new non-ionic surfactant, namely an alcohol ethoxylate non-ionic surfactant. The inventor has also developed a new concentrate glutaraldehyde solution, the solution having a higher concentration of glutaraldehyde, i.e. the concentrate solution comprises from 10% to 45% m/v of an aqueous solution of glutaraldehyde. Typical concentrate solutions contain 10%, 20%, 30% and 45% m/v glutaraldehyde, depending on the application of the solution.

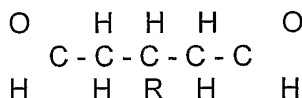
A concentrate solution contains 0.6 to 0.25% m/v the alcohol ethoxylate non-ionic surfactant (with a pH of 8.0 to 9.0), sodium acetate trihydrate to buffer the pH of the aqueous solution at about 6.0 to 8.5 and sufficient amount of a pH modifier (such as sodium hydroxide) to bring the pH of the aqueous solution up to 6.0 to 8.5, preferably 7.5. Usually the concentrate solution will include about 0.05% - 0.5% m/v sodium acetate trihydrate. In addition, the aqueous solution may contain a twin chain quaternary ammonium compound which has increased fungicidal activity of the solution and which also increases the foaming ability of the solution. The increased foaming ability provides a larger surface contact time on application of the product when sprayed onto large surfaces and thus increases the overall efficacy of the product. A twin chain quaternary ammonium compound is used in preference to a single chain of quaternary ammonium compound. The twin chain quaternary ammonium compound has greater steric hinderance to protect the nitrogen atom of the

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quaternary ammonium compound, making it more stable than glutaraldehyde and a single chain quaternary ammonium compound.

A twin chain quaternary ammonium compound has the formula $R_2-N(CH_3)_2Cl^-$ where R represents an alkyl straight chain. One preferred example is 1-decanamminium, N-decyl-N,N-dimethyl-chloride.

A glutaraldehyde composition according to the invention is prepared by heating water up to a temperature between 45°C to 50°C. Sufficient alcohol ethoxylate derivative is added to provide a concentrate containing from 0.6 to 25% m/v of alcohol ethoxylate derivative, while maintaining the temperature of the solution at 45°C to 50°C. Next, a required amount of glutaraldehyde solution is added to provide a concentrate having a glutaraldehyde concentration of 10 to 45% m/v, while keeping the temperature at 45°C to 50°C. The glutaraldehyde and detergent are allowed to react, while maintaining the temperature at 45°C to 50°C for a period of 15 to 30 minutes. During this time, the glutaraldehyde is cross-linked with the surfactant to create the following molecule:



Where R equals a 15 carbon long alcohol ethoxylated non-ionic surfactant. Cold water is then added to bring the solution up to 75% of the total volume of the concentrate solution.

Thereafter, all, some or one of the following ingredients may be added, depending on the application:

- a) Sufficient amount of a twin chain quaternary ammonium compound to provide a 0.1% – 15% m/v concentration in the concentrate.

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- b) Sufficient amount of a degreasing additive, for example a glycolic solvent to provide a concentration of 0.5% – 2% m/v in the concentrate.
- c) Sufficient amount of a glycolic acid to provide a 0.5% - 30% m/v concentration in the concentrate.
- d) Sufficient amount of sodium lauryl ethyl sulphate to provide a concentration of 5% - 20% m/v of the concentrate.
- e) Sufficient amount of water soluble silicon products to form a 0.01% - 0.2% m/v of the concentrate and to act as a defoamer in certain applications.

After all, or some, or one of the above ingredients is added, the solution is brought up to its final volume with water. Thereafter, the pH of the solution is adjusted to 7.5 to 8.5 with a pH modifier such as sodium hydroxide (typically a 1M aqueous solution). Thereafter, sodium acetate trihydrate is added to buffer the product at a pH of 6.0 to 8.5.

An anti-corrosive inhibitor such as sodium nitrate may then be added, and dyes may be added for aesthetic purposes, and liquid fragrances (that are non-nitrogen based) may also be added.

We refer now to the Figures. It will be seen that the ESI-HPLC-MS spectrum of the stabilised glutaraldehyde composition of the invention is very different from the starting materials shown in Figures 1-3. In particular, it will be noted that the spectrum for the alcohol ethoxylated non-ionic surfactant has a relatively flat profile with a homogeneous series of 44 m/z ($-\text{CH}_2\text{CH}_2-$). It would seem that the spectral detail is populated relatively uniformly across the mass range of the spectrum (the low mass range as well as the high mass range) with no region dominating in particular. While the spectrum for the stabilised glutaraldehyde composition of the invention (i.e. the glutaraldehyde cross-linked with the alcohol ethoxylate non-ionic surfactant) has the appearance of

a parabolic profile with a homologous series of 44 m/z ($-\text{CH}_2-\text{CH}_2-$). The spectral detail is populated at the high mass range (from just below 500 m/z to approximately 900 m/z) of the spectrum with relatively little detail in the low mass region (except for the 241 m/z ion). The highest ions in the given mass spectrum are 575.31 m/z, 619.32 m/z and 663.39 m/z.

The glutaraldehyde solutions described above have a shelf life of a minimum of six months.

In use, the concentrate solution is diluted to provide end use compositions being in the range of 0.001% to 5% m/v glutaraldehyde. When diluted, the end use compositions will typically have a pH of 6 to 8.5 which is the pH at which glutaraldehyde is optimally activated. At this neutral, or close to neutral pH, the solutions are non-corrosive and non-irritant and hence user friendly. Further, the concentrate glutaraldehyde solutions are compatible with products that may be used in end-use compositions, such as: defoamers (e.g. water-soluble synthetic silicon type products); degreasers (e.g. glycols); surfactants (e.g. sodium lauryl ethyl sulphate, triethalamines and cocoamides); thickeners (e.g. cellulose hydroxyls and starch thickeners), pH activators (e.g. citric acid); pesticides (e.g. permethrine) and other products that do not contain non-steric hindered nitrogen elements.

The product can be used in many applications, including in domestic cleaning products, personal hygiene products, as a water preservative, in sewage water purification, in pharmaceutical products as an effective biocide, in preventative medication including disinfecting of needles or washing needles, stabs or pricks etc. It is also useful as a machine cleaner in combination with other chemicals, such as glycolic acid, as an animal skin care washing or dipping products or for the cleaning of food products. The product is also compatible with degreasing chemicals, for example glycols.

End-use compositions made by diluting a concentrate composition according to the invention are set out below:

End-Use Composition	Percent (%) by Weight Active Glutaraldehyde
Medical Instrument Sterilent	2.0% – 3.2%
Domestic Household Cleaner	0.3% – 0.5%
Toilet Cleaner	1% – 5%
Waste Water Treatment	30% - 45% concentrates which are diluted to 0.001% – 0.025% when applied to waste water
Dairy Machine Cleaner	0.1% - 6%
Skin Cleansers and Creams	0.3% - 0.5%
Injectables and Skin Preventative Application	0.005% - 0.3%
Abattoir Cleaners and Degreasers for all Surfaces	0.1% - 5%
Wall and Surface Cleaners for the Poultry Industry	0.005% - 1%
Surface Disinfectants for Food Processing Industries	0.025% - 1%
Cell Culturing, Planting, Seedling Growing and Watering Systems	0.05% - 0.3%
Pesticide and Biocide	0.025% - 1%
Wipes and Swabs	0.1% - 0.3%

Examples

Example 1 - 10% m/v concentrate solution of glutaraldehyde

The ingredients of a 10% m/v low foam concentrate solution of glutaraldehyde according to the invention is set out below:

- a) 200-226 kg Ucarcide 250 50% w/w glutaraldehyde;
- b) 6-22 kg Tergitol 15.S9;
- c) 6-50 kg twin chain quaternary ammonium compound (1-decanamminium, N-decyl-N,N-dimethyl-chloride);
- d) 2.5 kg – 10 kg sodium acetate trihydrate;
- e) sufficient sodium hydroxide to bring the pH of the solution to 7.5;
- and
- f) 1-2 kg Dowanol DPM glycol (degreaser).

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The ingredients of a 1000 l 10% m/v high foam concentrate solution of glutaraldehyde is set out below:

- a) 200-226 kg Ucarcide 250 50% w/w glutaraldehyde;
- b) 100-150 g Tergitol 15.S.9;
- c) 6-50 kg twin chain quaternary ammonium compound (1-decanamminium, N-decyl-N,N-dimethyl-chloride);
- d) 2.5 kg – 10 kg sodium acetate trihydrate;
- e) sufficient sodium hydroxide to bring the pH of the solution to 7.5;
and
- f) 1-2 kg Dowanol DPM glycol (degreaser).

Example 2 – 20% m/v glutaraldehyde concentrate composition

The ingredients of a 1000 l 20% m/v glutaraldehyde solution of the invention is as set out below:

- a) 400-452 kg Ucarcide 250 50% w/w glutaraldehyde;
- b) 6-22 kg Tergitol 15.S.9;
- c) 6-50 kg twin chain quaternary ammonium compound (1-decanamminium, N-decyl-N,N-dimethyl-chloride);
- d) 5 kg – 15 kg sodium acetate trihydrate;
- e) sufficient sodium hydroxide to bring the pH of the solution to 7.5;
and
- f) 1-2 kg Dowanol DPM glycol (degreaser).

Example 3 – 30% m/v glutaraldehyde concentrate composition

The ingredients of a 1000 l 30% m/v glutaraldehyde solution of the invention is as set out below:

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- a) 600-678 kg Ucarcide 250 50% w/w glutaraldehyde;
- b) 6-22 kg Tergitol 15.S.9;
- c) 6-50 kg twin chain quaternary ammonium compound (1-decanamminium, N-decyl-N,N-dimethyl-chloride);
- d) 10 kg – 20 kg sodium acetate trihydrate;
- e) sufficient sodium hydroxide to bring the pH of the solution to 7.5;
and
- f) 1-2 kg Dowanol DPM glycol (degreaser).

Example 4 – 45% m/v glutaraldehyde concentrate composition

The ingredients of a 1000 l 45% m/v glutaraldehyde solution of the invention is as set out below:

- a) 900 kg Ucarcide 250 50% w/w glutaraldehyde;
- b) 6-22 kg Tergitol 15.S.9;
- c) 6-50 kg twin chain quaternary ammonium compound (1-decanamminium, N-decyl-N,N-dimethyl-chloride);
- d) 10 kg – 20 kg sodium acetate trihydrate;
- e) sufficient sodium hydroxide to bring the pH of the solution to 7.5;
and
- f) 1-2 kg Dowanol DPM glycol (degreaser).

CLAIMS

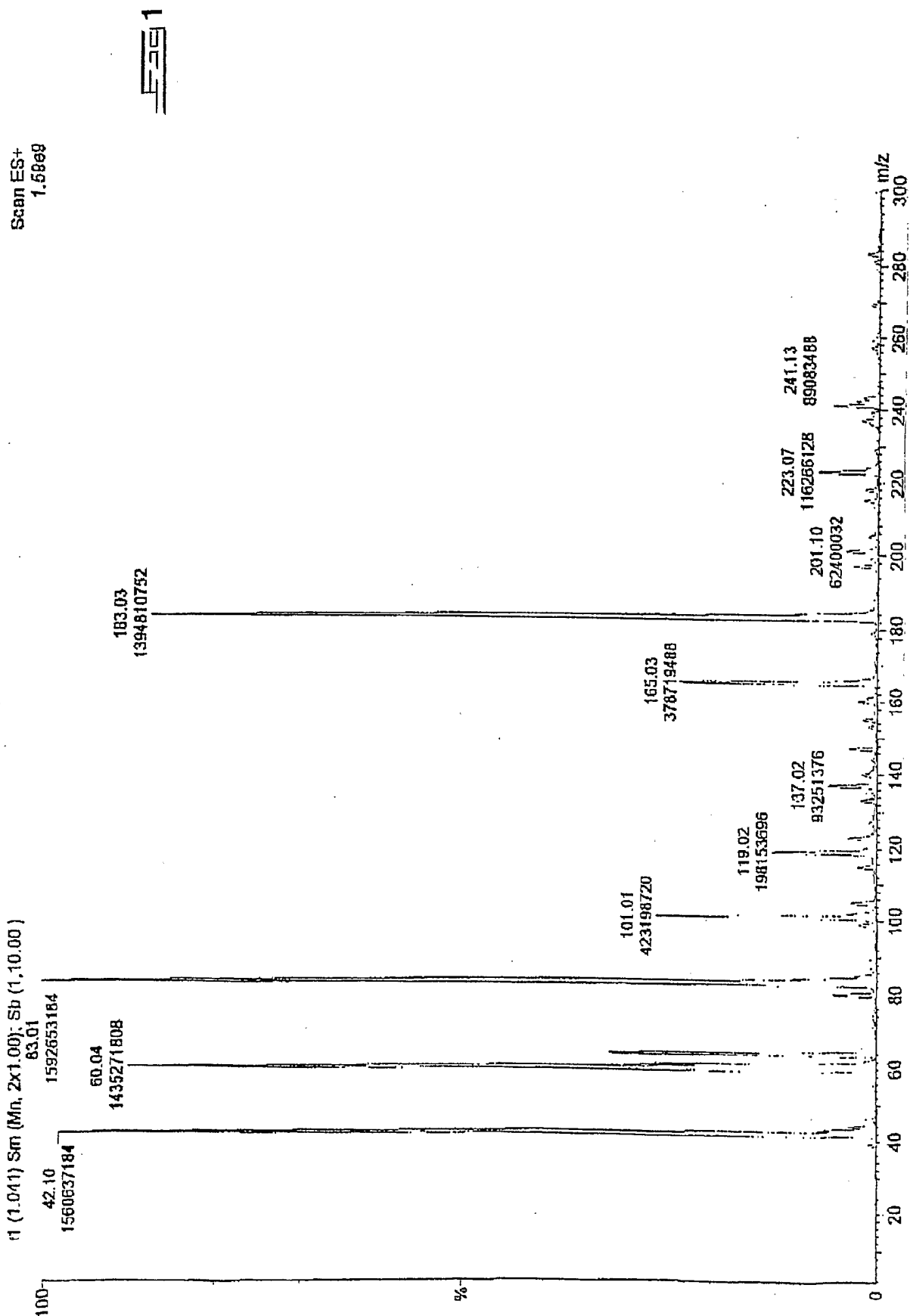
1. A stable aqueous glutaraldehyde solution including:
 - a 0.005% to 45% m/v solution of glutaraldehyde ($\text{OCH}(\text{CH}_2)_3\text{CHO}$);
 - an alcohol ethoxylate non-ionic surfactant;
 - sodium acetate trihydrate ($\text{NaC}_2\text{H}_3\text{O}_2$); and
 - sufficient amount of a pH modifier to bring the pH of the solution to 6.0 to 8.5.
2. A concentrate solution according to Claim 1 including 10% to 45% m/v glutaraldehyde.
3. A solution according to Claim 1 or 2 including as much sodium acetate trihydrate as is required to buffer the pH of the solution at 6.0 to 8.5.
4. A solution according to Claim 3 including about 0.05 to 0.5% m/v sodium acetate trihydrate.
5. A solution according to any one of the preceding claims containing sufficient pH modifier to bring its pH to 7.5.
6. A solution according to any one of the preceding claims wherein the alcohol ethoxylate non-ionic surfactant has a pH of 8.0 to 9.0 and, together with the sodium acetate trihydrate, functions as a buffer to maintain the aqueous solution of the invention at the pH of 6.0 to 8.5.
7. A solution according to Claim 6 wherein the alcohol ethoxylate non-ionic surfactant makes up from 0.6 to 25% m/v of the solution.

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8. A solution according to Claim 7 wherein the alcohol ethoxylate non-ionic surfactant is Tergitol-15S9.
9. A solution according to any one of the preceding claims wherein the pH modifier is a dilute aqueous solution of sodium hydroxide (NaOH).
10. A solution according to 9 wherein the pH modifier is a 1M aqueous NaOH solution.
11. A solution according to any one of the preceding claims further including a quaternary ammonium compound.
12. A solution according to claim 11 wherein the quaternary ammonium compound is a twin chain quaternary ammonium compound.
13. A solution according to claim 12 wherein the twin chain quaternary ammonium compound makes up from 0,1% to 15% m/v of the solution.
14. A method of producing any one of the stable aqueous glutaraldehyde solutions claimed in claims 1 - 13, the method including the steps of:
 - a) heating water to a temperature between 45°C to 50°C;
 - b) adding an alcohol ethoxylate non-ionic surfactant to the water, while maintaining the temperature of the solution so formed between 45°C to 50°C;
 - c) adding a glutaraldehyde solution to the solution;
 - d) maintaining the temperature of the solution at 45°C to 50°C for a period of 15 to 30 minutes to allow the glutaraldehyde to cross-link with the non-ionic alcohol ethoxylate surfactant;

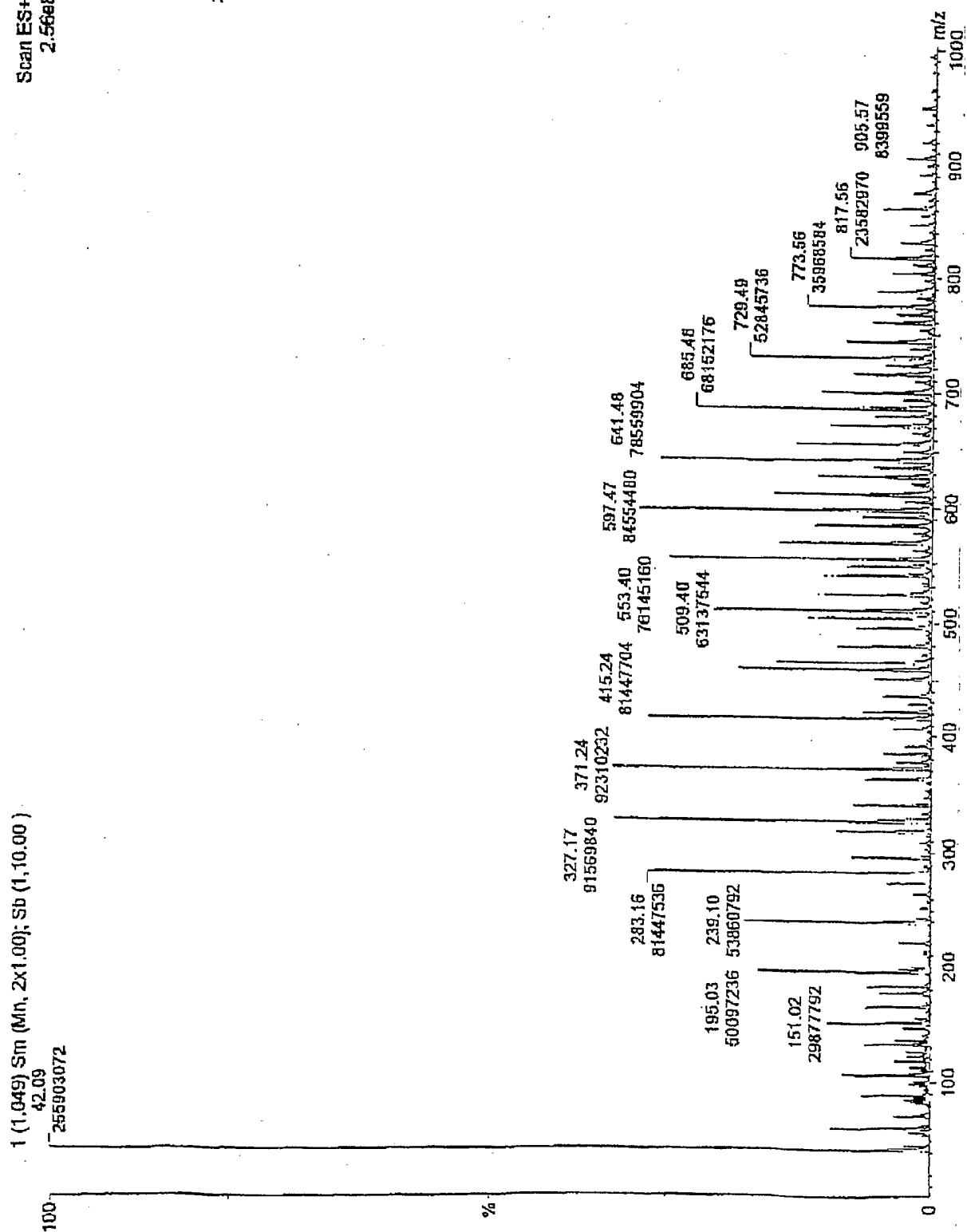
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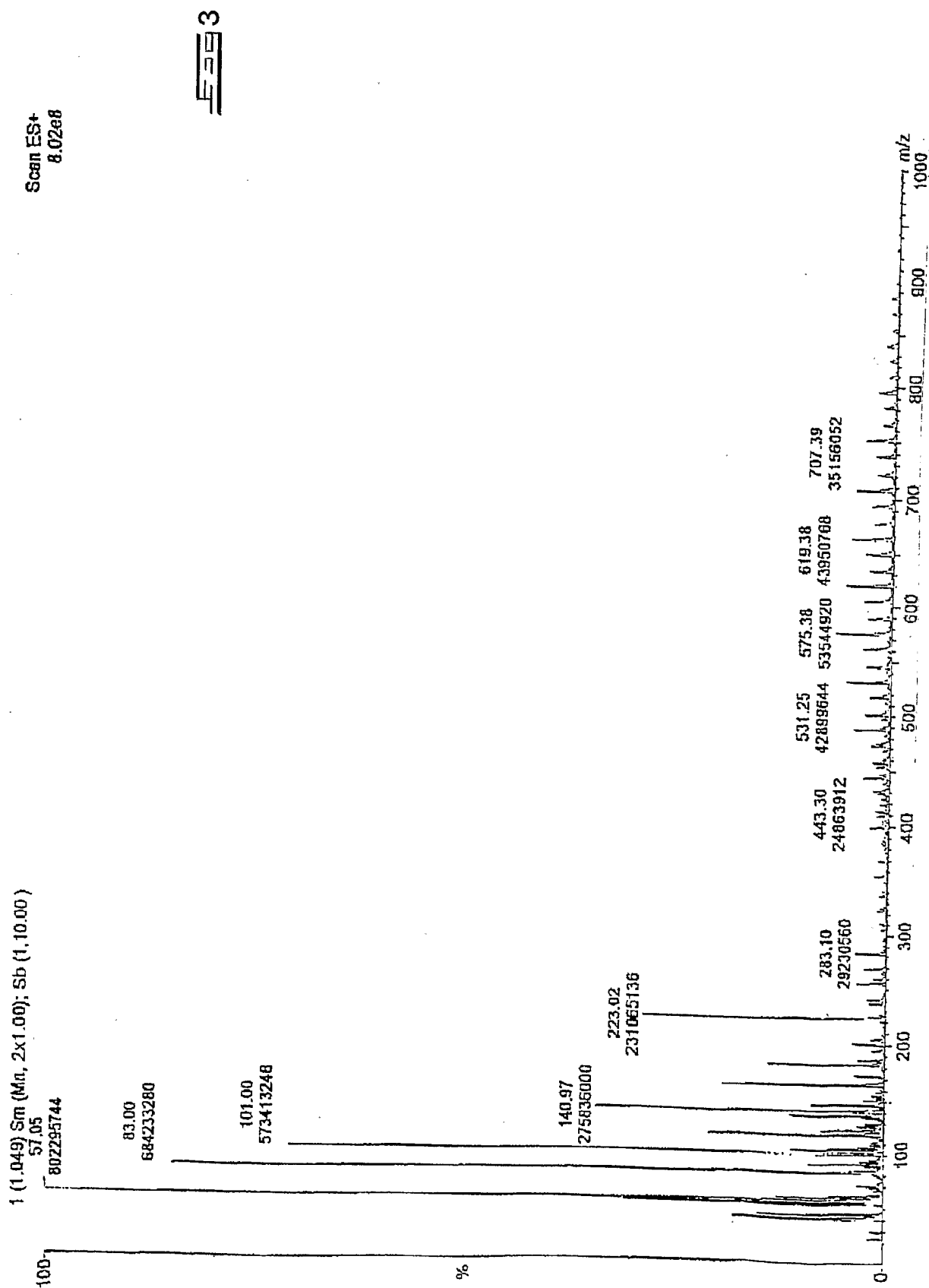
- e) optionally adding other active ingredients to the solution and decreasing the temperature of the solution by adding water to the solution;
 - f) adjusting the pH of the solution to 7.5 to 8.5 using a pH modifier; and
 - g) adding sodium acetate trihydrate to the solution to buffer the solution to a pH of 6.0 to 8.5.
15. A stabilised glutaraldehyde composition having an ESI-HPLC-MS spectrum where the spectral detail is populated in the high mass range (from just below 500 m/z to approximately 900 m/z) of the spectrum.
16. A stabilised glutaraldehyde composition having an ESI-HPLC-MS spectrum with a spectral detail substantially the same as that shown in Figure 4.

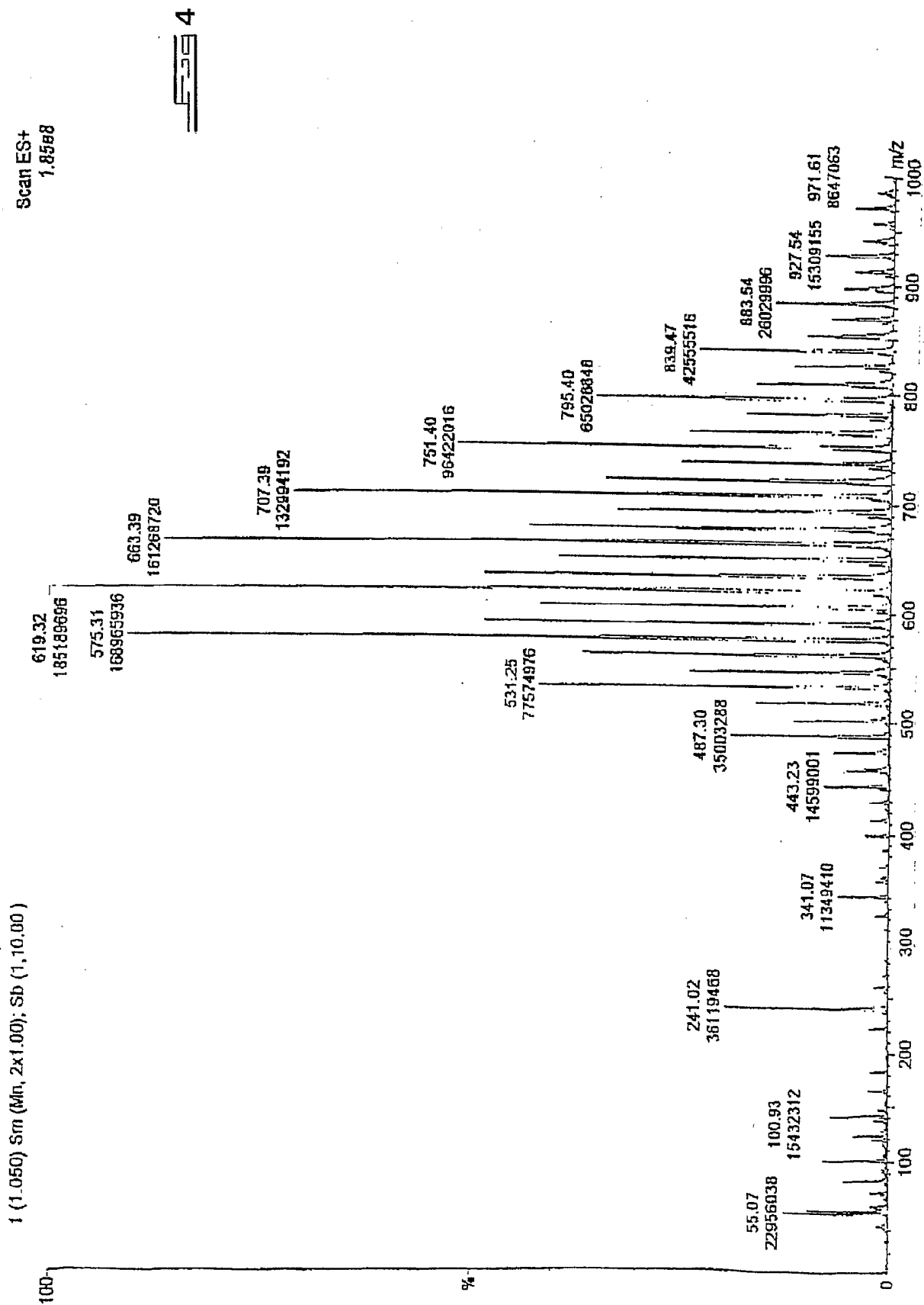


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INTERNATIONAL SEARCH REPORT

Int ional Application No

PCT/IB 02/02913

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A01N35/02 //(A01N35/02,25:30)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal, CHEM ABS Data, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 609 106 A (TONI MARTIN MARKETING AND DIST) 3 August 1994 (1994-08-03)	1-10, 14-16
Y	the whole document	11-13

X	US 3 912 450 A (BOUCHER RAYMOND MARCEL GUT) 14 October 1975 (1975-10-14)	1-10, 14-16
	column 1, paragraph 1	
	column 5, paragraph 2	
	column 6, line 16-25	
	tables I-V	
	claims 1,3,5,6	

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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

23 September 2002

Date of mailing of the international search report

04/11/2002

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 02/02913

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 405 785 A (WAVE ENERGY SYSTEMS) 10 September 1975 (1975-09-10) page 1, line 11-14 page 2, line 18-40 page 3, line 79-93 tables 4,5 claims 1,2,6-8	1-10, 14-16
X	US 3 968 248 A (BOUCHER RAYMOND MARCEL GUT) 6 July 1976 (1976-07-06) column 1, line 14-24 column 5, line 14-38 tables I-V claim 1	1-10, 14-16
X	FR 2 622 397 A (SOGÉVAL) 5 May 1989 (1989-05-05)	1-16
Y	the whole document	11-13
X	US 5 158 778 A (DONOVAN DANIEL J ET AL) 27 October 1992 (1992-10-27) the whole document	1-10, 14-16
Y	column 10, line 17-28	11-13
X	US 4 093 744 A (WINICOV MURRAY W ET AL) 6 June 1978 (1978-06-06) column 1, line 1-20 column 3, line 15-31 column 4, line 17-31 table I claims 1-3	1-10, 14-16
Y	AU 689 928 B (WHITELEY IND PTY LTD) 9 April 1998 (1998-04-09) the whole document	11-13
A	EP 0 836 803 A (SOGÉVAL SA) 22 April 1998 (1998-04-22) the whole document	1-16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 02/02913

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: —
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 15-16 relate to a compound defined (inter alia) by reference to analytical parameters:

The use of these parameters in the present context is considered to lead to a lack of clarity within the meaning of Article 6 PCT. It is impossible to compare the parameters the applicant has chosen to employ with what is set out in the prior art. The lack of clarity is such as to render a meaningful complete search impossible. Consequently, the search has been restricted to the subject-matters of said claims, as defined by the technical features of the preceding composition claims 1-13.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

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