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CHEMICAL DISINFECTANTS BASED ON PHENOLIC ACTIVE COMPONENTS AND GLUTARALDEHYDE
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- (56) Prior Art Documents
AU 77341/87
DD 220893
US 3917850
- (57)

The invention relates to the use of microbicidal phenolic compounds in combination with glutaraldehyde for the preparation of disinfectants which are suitable for the disinfection of surfaces and instruments, but also of parts of the body (for example hands) in hospitals and doctors' surgeries.

Claim

1. A method of disinfecting surfaces, instruments and parts of the body which comprises applying to and allowing to act thereupon, a disinfecting amount of a composition comprising (a) 2-phenyl-phenol and/or para-chloro-meta-cresol and (b) glutaraldehyde, wherein (b) is present in an amount less than (a).



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(72) Erfinder; und (75) Erfinder/Anmelder (nur für US): EXNER, Otto [DE/DE]; Ziegler-Strasse 51, D-40878 Ratingen (DE). HOFFMANN, Manfred [DE/DE]; Ingerstrasse 24, D-47918 Tönisvorst (DE).			
(74) Gemeinsamer Vertreter: BAYER AKTIENGESELLSCHAFT; D-51368 Leverkusen (DE).			
(54) Title: CHEMICAL DISINFECTANTS BASED ON PHENOLIC ACTIVE COMPONENTS AND GLUTARALDEHYDE			
(54) Bezeichnung: CHEMISCHES DESINFEKTIONSMITTEL AUF BASIS PHENOLISCHER WIRKKOMPONENTEN UND GLUTARALDEHYD			
(57) Abstract Described is the use of microbicidal phenol compounds in combination with glutaraldehyde in the production of disinfectants suitable for the disinfection of surfaces and instruments as well as parts of the body (e.g. the hands) in hospitals and doctors' practices.			
(57) Zusammenfassung Beschrieben wird die Verwendung von mikrobiziden Phenolverbindungen in Kombination mit Glutaraldehyd zur Herstellung von Desinfektionsmitteln, die für die Desinfektion von Flächen und Instrumenten, aber auch von Körperteilen (z.B. Hände) in Krankenhäusern und Arztpraxen geeignet sind.			

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Chemical disinfectant based on phenolic active
components and glutaraldehyde

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The invention relates to the use of microbicidal phenolic compounds in combination with glutaraldehyde for the preparation of disinfectants which are suitable for the disinfection of surfaces and instruments, but also of parts of the body (for example hands) in hospitals and doctors' surgeries.

- 10 It is known that there is a considerable risk of infection for patients and staff in hospitals and in doctors' surgeries from microorganisms such as bacteria, yeasts and viruses which are pathogenic to humans. Taking into account this risk of infection for patients and staff, the disinfection of surfaces and instruments in hospitals and doctors' surgeries is of particular importance. Apart from the known causative agents of
- 15 hospitalism from amongst the bacteria and yeasts, viruses have gained increasing importance amongst disinfection procedures.

- The requirements regarding the effectiveness of disinfectants are described, for example, in the regulations of the DGHM (Dt. Gesellschaft für Hygiene und Mikrobiologie [German Society for Hygiene and Microbiology]) and the guideline of
- 20 the Bundesgesundheitsamt (BGA [Federal Health Office]) and the Dt. Vereinigung zur Bekämpfung von Viruserkrankungen (DVV [German Association for Viral Disease Research]). Disinfectants which meet the DGHM requirements are listed in the VII list as per 1.1.92. Nothing is mentioned as yet in these lists on the virucidal properties of the disinfectants.

- 25 When used at concentrations, and over periods, which are relevant under realistic

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conditions, the combination according to the invention guarantees a greatly reduced number of pathogenic microorganisms amongst bacteria and yeasts and also inactivation of, for example, DVV-listed, naked and enveloped viruses while fully meeting current requirements. The invention is based on a combination of microbicidal phenolic compounds (ph) and glutaraldehyde (glu).

Phenolic active substances for the disinfection of surfaces and instruments are known (Ullmann-Enzyklopädie der tech. Chemie [Ullmann's Encyclopaedia of Chemical Engineering], 4th Edition, 1975, Volume 20, pp. 41-58). It is furthermore known that microbicidal phenolic compounds have an insufficient activity against naked viruses. It is also known that inactivation of naked viruses, such as polio, is made possible by concentrations from 1% of glutaraldehyde (10,000 ppm) in alkaline solution.

CA 2.015.079 describes a disinfectant composed of glu, o-phenylphenol, p-tert-amylphenol, sodium arylalkylsulphonate, citric acid and water. A combination of the abovementioned active substances allows stabilization and an activity specifically against bacteria which are pathogenic to humans, even in the acidic range. A virucidal activity is not described. Moreover, this formulation comprises an extremely large amount of glu, which results in odour and corrosion problems and might, under certain circumstances, cause allergic reactions.

The invention therefore relates to the use of a combination of glutaraldehyde and 2-phenyl-phenol and/or para-chloro-meta-cresol for the disinfection of surfaces, instruments and parts of the body.

The combinations according to the invention meet the following requirements as disinfectants:

- broad activity against bacteria (yeasts) and viruses which are pathogenic to humans;
- within a realistic timespan, the numbers of microorganisms or viruses which exist on the surfaces are reduced reliably to a level that meets requirements:



- the active substance components employed were chosen in such a way that optimal effectiveness is achieved using the lowest possible use concentrations, both of phenolic microbicides and of glu;
- very low concentrations of glu in the use solutions minimize the hazard potential of odour nuisance, of a potential sensitization and of discolouring (of the skin) while maintaining full virucidal effectiveness;
- use of readily biodegradable surfactants which are kind to the skin;
- the shelf life of the disinfectant concentrates is not less than a year.

The combinations according to the invention are generally in the form of liquid concentrated formulations which are generally used according to the invention after dilution with water.

In general, the concentrates according to the invention comprise 2-20% by weight, preferably 3-15% by weight, and especially 3-12% by weight, of the microbocidal phenolic compounds. If appropriate, the ratio between o-phenylphenol and para-chloro-meta-cresol is 100:0 to 0:100 parts by weight.

Moreover, the concentrates according to the invention comprise 2-50% by weight, preferably 2-10% by weight and especially 2-5% by weight, of glutaraldehyde.

Moreover, the concentrates according to the invention preferably comprise acidifiers, such as citric acid, lactic acid and malic acid to bring the pH of the preparations to 2 to 7, preferably 2.3 to 5, especially 2.5 to 4.

The concentrates according to the invention furthermore preferably comprise up to 50% by weight, in particular 10 to 40% by weight, of auxiliaries, such as surfactants, preferably anionic, optionally ethoxylated surfactants, such as, for example, secondary alkylsulphonates having 12 to 14 carbon atoms on average, alkylsulphosuccinates and/or alkyl ether sulphonates, diluents such as, for example, alcohols, preferably



isopropanol, 1,2-propanediol, glycols and/or diluents which are miscible with water, and customary auxiliaries such as perfumes, corrosion inhibitors such as benzotriazole or tolyltriazole, colourants and/or complexing agents and, if appropriate, other substances which act as disinfectants.

- 5 The concentrates according to the invention furthermore comprise up to 75% by weight, in particular 10 to 50% by weight, of water.

A preferred concentrate comprises

- | | | |
|----|---------|-----------------------------------|
| | 5 - 15 | % by weight of phenolic compounds |
| | 3 - 4 | % by weight of glutaraldehyde |
| 10 | 10 - 20 | % by weight of organic diluents |
| | 5 - 25 | % by weight of surfactants |

and water up to 100% by weight.

- The preparations according to the invention are commercially available as concentrates and are generally used in the form of aqueous dilutions. The aqueous dilutions
- 15 preferably comprise 0.5 to 5% of the combinations according to the invention.

The preparations according to the invention are prepared in the customary manner by adding the individual components and mixing thoroughly until clear solutions are obtained.



Examples

To test the disinfectant combination according to the invention for its microbicidal and virucidal activity, a concentrate of the following composition is prepared by mixing the individual components.

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Example 1	Example 2	Example 3	Example 4
4.5% by weight of parachloro-meta-cresol	-	11.5% by weight of PCMC	4.8% by weight of PCMC
7.0% by weight of ortho- phenylphenol	11.5% by weight of OPP	-	4.8% by weight of pine oil
3.75% by weight of glutaraldehyde	3.75% by weight of glutaraldehyde	3.75% by weight of glutaraldehyde	3.75% by weight of glutaraldehyde
2.0% by weight of lactic acid	2.0% by weight of lactic acid	2.0% by weight of lactic acid	2.0% by weight of lactic acid
15.0% by weight of isopropanol	15.0% by weight of isopropanol	15.0% by weight of isopropanol	15.0% by weight of isopropanol
10.0% by weight of diisooctyl sulfosuccinate	10.0% by weight of diisooctyl sulfosuccinate	10.0% by weight of diisooctyl sulfosuccinate	10.0% by weight of diisooctyl sulfosuccinate
10.0% by weight of sodium lauryl ether sulfate (2 EO) made up to 100% with demineralized water	10.0% by weight of sodium lauryl ether sulfate (2 EO) made up to 100% with demineralized water	10.0% by weight of sodium lauryl ether sulfate (2 EO) made up to 100% with demineralized water	10.0% by weight of sodium lauryl ether sulfate (2 EO) made up to 100% with demineralized water

Testing for bacteriological activity with the concentrate of Example 1

25 A. Qualitative suspension disinfection

in accordance with the Guidelines for Testing and Assessing Chemical Disinfectant Methods/DGHM (as per 01.01.81) (Deutsche Gesellschaft für Hygiene und Mikrobiologie, Stuttgart-New York; Fischer Section 1 (J. Bornhoff; Special Edition 1.1.1981).

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100% of the microorganisms indicated in Table 1 are destroyed after a contact period of 5 minutes by the following dilutions of the concentrate of Example 1.



Table 1

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Test microorganisms		Use concentration in %, contact period of 5 minutes
Staphyococcus aureus	ATCC 6538	0.75
Escherichia coli	ATCC 11229	0.50
Proteus mirabilis	ATCC 14153	0.50
Pseudomonas aeruginosa	ATCC 15442	0.50
Candida albicans	ATCC 10231	0.25
Aspergillus flumigatus	DSM 819	1.00

B. Tuberculocidal activity, test with carriers of microorganisms

modified in accordance with DGHM Guideline I/2.4.2

(Test report; L & S GmbH Bad Bocklet, Leimbeck/Grötsch 8.1.1993)

Table 2

After the exposure times indicated, a tuberculocidal activity was found with the following use concentrations in %:

Test organism	Exposure time in minutes				
	15	30	60	120	
Mycobakterium terrae ATCC 15755	3	2	2	2	%

Virucidal efficacy data

C. Virucidal effectiveness against Hepatitis B (HBV) and HIV

in accordance with "DNS polymerase test" and HIV after the "Richtlinie des Bundesgesundheitsamt und der Deutschen Vereinigung zur Bekämpfung der Viruskrankheiten zur Prüfung von chemischen Desinfektionsmitteln auf Wirksamkeit gegen Viren" [Guideline of the Federal Health Office and the German Association for Virus Disease Research for Testing chemical Disinfectants for antiviral activity]. (Test report; Steinmann 28.1.1993, Staatl. Hygieneinstitut Bremen)



The following use concentrations in % and the following exposure times are determined.

Virus	%	Exposure time in minutes
Hepatitis B	1.0	30
	0.5	60
HIV-1	1.0	30
	0.5	60

D. Virucidal activity against viruses as stipulated by the DVV

in accordance with "Richtlinie des Bundesgesundheitsamt (BGA) und der Deutschen Vereinigung zur Bekämpfung der Viruskrankheiten (DVV) zur Bekämpfung von chemischen Desinfektionsmitteln auf Wirksamkeit gegen Viren "[Guideline of the Federal Health Office and the German Association for Viral Disease Research for the control of chemical Disinfectants for antiviral Activity]. (Test report; Steinmann 28.1.1993, Staatl. Hygieneinstitut Bremen)

The following use concentrations in % are required for inactivating the important viruses given below:

Virus	%	Exposure time in minutes
Papovavirus SV 40	3.0	60
Herpes simplex virus (HSV) type 1	0.5	5
Polio virus type 1 strain Malhony/Pette	4.0	5
Vacciniavirus strain Elstree	0.5	5
Adenovirus type 2 strain adenoid	1.0	30



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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of disinfecting surfaces, instruments and parts of the body which comprises applying to and allowing to act thereupon, a disinfecting amount of a composition
5 comprising (a) 2-phenyl-phenol and/or para-chloro-meta-cresol and (b) glutaraldehyde, wherein (b) is present in an amount less than (a).
2. The method according to claim 1 wherein said composition further comprises one or more acidifiers.
10
3. The method according to either claims 1 or 2 wherein said composition comprises 2-20% by weight of (a) and 2-50% by weight of (b).
4. The method according to either claims 1 or 2 wherein said composition comprises 5-15% by weight of (a) and 3-4% by weight of (b).
15
5. The method according to either claims 1 or 2 wherein said composition comprises 11.5% by weight of (a) and 3.75% by weight of (b).
- 20 6. The method according to any one of claims 1-5 wherein said composition is in the form of an aqueous dilution, said composition being present in an amount by weight of 0.5 to 5%.

DATED this 29th day of September, 1997.

25

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By Its Patent Attorneys

DAVIES COLLISON CAVE



Chemical disinfectant based on phenolic active components and glutaraldehyde

A b s t r a c t

Described is the use of microbicidal phenolic compounds in combination with glutaraldehyde for the preparation of disinfectants which are suitable for the disinfection of surfaces and instruments, but also of parts of the body (for example hands) in hospitals and doctors' surgeries.



INTERNATIONAL SEARCH REPORT

Initial Application No.

PCT/EP 94/01572

A. CLASSIFICATION OF SUBJECT MATTER

IPC 5 A01N35/02 //(A01N35/02,31:08)

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 5 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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP,A,0 255 875 (CHEMICAL Z.C.ITALIANA) 17 February 1988 see page 2, line 14 - page 3, line 1 see page 3, line 22 ---	1-8
X	US,A,4 654 374 (H.MARTIN) 31 March 1987 see column 3, line 28 - line 45 ---	2-4,7,8
X	CA,A,2 015 079 (H.MARTIN) 23 April 1991 cited in the application see page 9, line 10 - page 10, line 2 ---	1,3,4,7,8
X	US,A,3 917 850 (R.M.G.BOUCHER) 4 November 1975 see column 1, line 55 - line 64 see column 2, line 6 - line 30 see column 15, line 15 - line 27 --- -/--	1-8

☒ 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
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"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

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Date of the actual completion of the international search

26 September 1994

Date of mailing of the international search report

11.10.94

Name and mailing address of the ISA

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Authorized officer

Lamers, W

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 94/01572

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP,A,0 279 704 (HEALTH CARE PRODUCTS) 24 August 1988 see page 3, line 58 - line 59 see page 4, line 30 - line 36 see page 6, line 57 - page 7, line 3 ---	1,4,7,8
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INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. Application No

PCT/EP 94/01572

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		NL-C- 95816	
		US-A- 2874087	

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen
PCT/EP 94/01572

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
IPK 5 A01N35/02 //(A01N35/02,31:08)

Nach der Internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

B. RECHERCHIERTE GEBIETE

Recherchiertes Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
IPK 5 A01N

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X	EP,A,0 255 875 (CHEMICAL Z.C.ITALIANA) 17. Februar 1988 siehe Seite 2, Zeile 14 - Seite 3, Zeile 1 siehe Seite 3, Zeile 22 ---	1-8
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☒ Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

☒ Siehe Anhang Patentfamilie

* Besondere Kategorien von angegebenen Veröffentlichungen :

"A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist

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"X" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann allein aufgrund dieser Veröffentlichung nicht als neu oder auf erfinderischer Tätigkeit beruhend betrachtet werden

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"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist

Datum des Abschlusses der internationalen Recherche

26. September 1994

Absendedatum des internationalen Recherchenberichts

11.10.94

Name und Postanschrift der Internationalen Recherchenbehörde
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Bevollmächtigter Bediensteter

Lamers, W

C.(Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X	EP,A,0 279 704 (HEALTH CARE PRODUCTS) 24. August 1988 siehe Seite 3, Zeile 58 - Zeile 59 siehe Seite 4, Zeile 30 - Zeile 36 siehe Seite 6, Zeile 57 - Seite 7, Zeile 3 ---	1,4,7,8
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INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen

PCT/EP 94/01572

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
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CA-A-2015079	23-04-91	KEINE	
US-A-3917850	04-11-75	KEINE	
EP-A-0279704	24-08-88	US-A- 4978530	18-12-90
		AU-A- 1196488	25-08-88
		JP-A- 63294860	01-12-88
CH-A-637267	29-07-83	KEINE	
EP-A-0264658	27-04-88	AU-A- 7734187	31-03-88
		JP-A- 63091304	22-04-88
DD-A-220893		KEINE	
EP-A-0553628	04-08-93	DE-A- 4202051	29-07-93
		CA-A- 2087896	26-07-93
CH-A-340013		BE-A- 544980	
		GB-A- 789713	
		LU-A- 34050	
		NL-C- 95816	
		US-A- 2874087	