



## EUROPEAN PATENT APPLICATION

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### (54) ANTIMICROBIAL AGENT CONTAINING HYPOCHLOROUS ACID

(57) The purpose of the present invention is to provide a hypochlorous acid aqueous solution having excellent antimicrobial effect and safety.

An antimicrobial agent is provided, which is a hypochlorous acid aqueous solution with a pH 6.0 to 6.7, wherein the effective chlorine concentration in the aqueous solution is from 50 to 260 ppm. Further, a sterilization

method is provided, which is characterized by immersing the member to undergo sterilization treatment in the aforementioned antimicrobial agent for 0.5 to 10 minutes. The antimicrobial agent has a broad antimicrobial spectrum of norovirus, Staphylococcus aureus and other bacteria, yeast belonging to Rhodotorula, and Cladosporium cladosporioides and other fungi.

[0021] The bacterium is preferably any one of bacterium selected from the group consisting of Clostridium butyricum and Clostridium sporogenes. The virus is preferably any one of virus selected from the group consisting of Feline panleukopenia virus, Canine parvovirus, and Measles virus.

#### Example 9

(Virucidal effects against viruses)

(1) Strains to be tested

[0096] Feline panleukopenia virus (ATCC (Registered trademark) VR-648) and Canine parvovirus (ATCC VR-2017), both of which are parvovirus belonging to Parvoviridae, and Measles virus(ATCC VR-24) belonging to Paramyxoviridae were used.

[Table 22]

	Virus name		
	Feline panleukopenia virus	Canine parvovirus	Measles
Negative control	Phosphate buffer	Phosphate buffer	Phosphate buffer
Positive control (x 10 dilution)	Virus suspension	Virus suspension	Virus suspension
Sample (x 10 dilution)	the aqueous hypochlorous acid solution	the aqueous hypochlorous acid solution	the aqueous hypochlorous acid solution

[Table 23]

Feline panleukopenia virus		Ref. section		Test Section (ppm)		
pH of sample	Treatment time	Negative	Positive	150	200	260
		Viable cell number		Viable cell number		
3.0	10 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
4.5	10 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
5.5	10 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
6.5	10 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.9}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
[CID <sub>50</sub> /50 $\mu$ L]						

[Table 24]

Canine parvovirus		Ref. section		Test Section (ppm)		
pH of sample	Treatment time	Negative	Positive	150	200	260
		Viable cell number		Viable cell number		
3.0	10 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
4.5	10 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
5.5	10 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
6.5	10 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
	60 sec.	$<10^{0.5}$	$10^{2.7}$	$<10^{0.5}$	$<10^{0.5}$	$<10^{0.5}$
[TCID <sub>50</sub> /50 $\mu$ L]						

**[0105]** As shown in Tables 23 to 25, in positive control section, multiplication of the viruses is observed in all of them. However, it was not observed in test section. Accordingly, the aqueous hypochlorous acid solution of the present invention is virucidal effects against Feline panleukopenia virus, Canine parvovirus, and Measles viruses in low pH range.

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Fig. 4

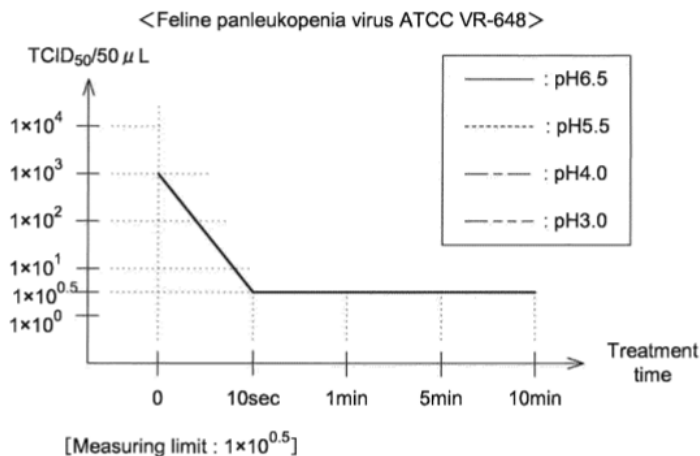


Fig. 4 is a graph showing antiviral effect for Feline panleukemia virus (Feline panleukemia virus) ATCC VR-648.

Fig. 6

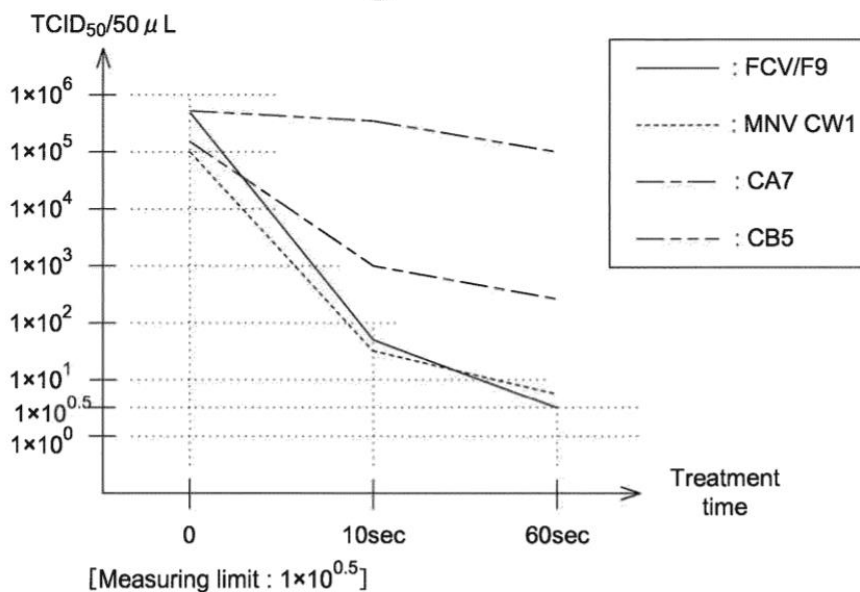


Fig. 6 is the graph showing the antiviral effects against Feline panleukopenia virus, Canine parvovirus, and Coxsackie virus.

## Claims

12. The antimicrobial agent according to claim 4, wherein the virus is any one of virus selected from the group consisting of Feline panleukopenia virus, Canine parvovirus, and Measles virus.