


**Research report on the in vitro inactivation effect of
VIRSHA (potassium hydrogen monopersulphate) on new
coronavirus (SARS-CoV-2)**

Sample No.: 2020-49-238
Sample Name: potassium hydrogen monopersulphate
powder
Sample brand: VIRSHA
Inspection Company:  Hebei Erao Biotech Co., Ltd.

**JIANGSU PROVINCIAL CENTER FOR DISEASE
CONTROL AND PREVENTION**

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1. Test materials

- 1.1. Test virus strain: SARS-CoV-2 virus strain (BetaCoV/JS27/human/2020, isolated from clinical cases of new coronary pneumonia in Jiangsu Province, which has been sequenced and identified).
- 1.2. Cell line: African green monkey kidney cells (Vero-E6).
- 1.3. Samples: VIRSHA (potassium hydrogen monopersulphate powder). Lot number: 202007235, production date: 20200723, expiration date: 24 months. Main ingredients: potassium hydrogen monopersulphate compound, sodium chloride, effective content: equivalent to available chlorine $11\% \pm 1\%$.
- 1.4. Neutralizer: 1g/L sodium thiosulfate + 1g/L lecithin.
- 1.5. Culture medium: DMEM maintenance medium, DMEM growth medium.

2. Test method

- (1) Test basis: Refer to "Technical Specifications for Disinfection" (2002 Edition) 2.1.1.10.5 and 2.1.1.10.7.
- (2) Neutralizer identification test: The effect of disinfectant 1:100 (1000mg/L) and neutralizer.
- (3) Virus inactivation test: According to the requirements, prepare 1000mg/L, 500mg/L, 250mg/L disinfectant solution with clean water in the ratio of 1:100, 1:200, 1:400. The corresponding action time of each concentration is: 20min, 30min; 5min, 10min; 3min, 5min.

3. Test results

Table 1: Neutralizer identification test results		
Item	Log value of virus titer(TCID ₅₀) for each test	Log value of virus titer(TCID ₅₀)

	(1)	(2)	(3)	for each test
(Disinfectant Solution + Virus Solution) + Neutralizer	0.50	0.50	0.50	0.50
Virus Solution + Neutralizer	5.00	4.75	5.00	4.92
Virus Liquid + Neutralization Product	4.75	5.00	4.75	4.83
Virus solution (positive control)	5.25	5.00	5.00	5.08

Note: The negative control cells grow well. The error rates among the three neutralizer identification tests 2, 3, and 4 were 3.3%, 2.2%, and 2.2%, respectively.

Table 2: Inactivation effect of VIRSHA potassium hydrogen monopersulphate disinfectant on SARS-CoV-2 virus

Disinfectant concentration	Inactivation effect at different time				
	3min	5min	10min	20min	30min
250mg/L (1:400)	ND	ND	ND	Not Completely	Not Completely
500mg/L (1:200)	ND	Not Completely	Not Completely	ND	ND
1000mg/L (1:100)	Completely Kill	Completely Kill	ND	ND	ND

* ND: The disinfection test at this point of action has not been carried out;


*Not completely kill: the cells in the negative control group grow normally, and when the logarithm of the virus titer of the virus solution (positive control group) is ≥ 5.0 , the cells in the disinfection test group have lesions, which are consistent with the cytopathic changes in the positive control group;


*Completely kill: The cells in the negative control group grow normally, and when the logarithm of the virus titer of the virus solution (positive control group) is ≥ 5.0 , the cells in the disinfection test group have no pathological changes, which is consistent with the growth of the cells in the negative control group.

4. Analysis conclusion

According to the relevant technical specifications of the new coronavirus (SAR S-CoV-2) operation of the BSL-3 laboratory of the Jiangsu Provincial Center for Disease Control and Prevention and the test protocol agreed with the tester, for inspection the VIRSHA potassium hydrogen monopersulphate disinfectant produced by Hebei Erao Biotech Co., Ltd. (batch number: 202007235, production date: 20200723, expiration date: 24 months. Main ingredients: potassium hydrogen monopersulphate compound, sodium chloride. Effective content: equivalent to Effective chlorine $11\% \pm (1\%)$. The in vitro killing effect of the new coronavirus (SAR S-CoV-2) was tested, and the results of the study showed that:

- 1) Neutralizer 1g/L sodium thiosulfate + 1g/L lecithin has no adverse effects on cells and viruses.
- 2) Sample submitted for inspection: VIRSHA potassium hydrogen monopersulphate disinfectant is diluted 1: 100 (1000mg/L) and then used to inoculate the SARS-CoV-2 virus for 3 minutes and 5 minutes, respectively, to inoculate Vero-E6 cells, and the results show that it can be completely inactivated Kill SARS-CoV-2 virus; Dilute 1:200 (500mg/L) with SARS-CoV-2 virus for 5min and 10min respectively, inoculate Vero-E6 cells, the results show that SARS-CoV-2 virus cannot be completely killed; 1:400 (250mg/L) diluted with SARS-CoV-2 virus for 5min, 10min, respectively, inoculate Vero-E6 cells, the results showed that SARS-CoV-2 virus could not be completely killed.

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