News Release

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Osaka Medical and Pharmaceutical University
Sakai Chemical Industry Co., Ltd.

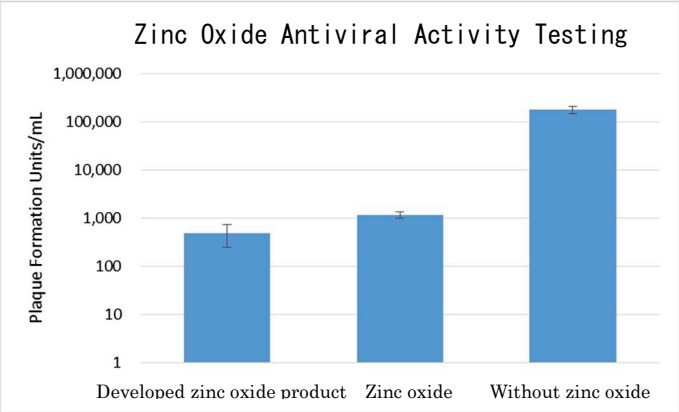
Confirmation That Zinc Oxide Reduces COVID-19 Infectivity

■ Overview

Department of Microbiology and Infection Control, Faculty of Medicine, Osaka Medical and Pharmaceutical University (Takatsuki City, Osaka, President: Kouichi Sano) and Sakai Chemical Industry, Co., Ltd. (Head Office: Sakai City, Osaka, President: Masaaki Yabe) have revealed ahead of the world that zinc oxide is effective in reducing the infectivity of COVID-19.

Originally, the antibacterial and antiviral effects of zinc oxide have been known, but we have confirmed that it is also effective against COVID-19.

When 0.1 g of zinc oxide (particle size: 2 μm) was added to a virus solution and the infectivity was examined after one hour, it was confirmed that the infectivity of the COVID-19 virus had been reduced by 99% or more compared to one without zinc oxide. Zinc oxide is a material that is widely used in paints, textiles, cosmetics, and molded resin products, and is expected to be applied to products for preventing COVID-19 infections in the future.



Number of plaques formed (measured three times)

	Average value	Standard deviation
Developed zinc oxide product	483	236
Zinc oxide	1,167	176
Without zinc oxide	178,333	29,297

* Developed zinc oxide product, the zinc oxide particle size is 2 μm.

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1. Research Background

Zinc oxide has been used in a wide range of fields in applications such as white pigments, deodorants, UV shielding materials, heat dissipation materials, and vulcanization accelerator agent. In addition, its antibacterial and antiviral effects have been known from the past, and it has a track record of use in compounds for some applications. This study tested whether it is effective against COVID-19 (hereinafter referred to as SARS-CoV-2).

2. Test Method

1) 0.1 g of zinc oxide powder was placed in a 50 mL tube, and 5 mL of virus solution containing SARS-CoV-2 with 500,000 infectivity titer was added.
2) The mixture was treated for 1 hour at room temperature while being shaken.
3) The treated sample was separated into powder and virus solution by centrifuge, and the centrifugation supernatant was diluted with cell culture medium.
4) The diluted virus solution was inoculated into SARS-CoV-2 sensitive cells.
5) After 2 hours, the cell culture medium was replaced with methyl-cellulose viscous medium, and cultured in an incubator at 37°C for 2 days.
6) After fixing cells with formaldehyde and staining them with crystal violet, the plaques (clusters of dead cells) formed by viral infection were observed and quantified.

3. Test Results

A decrease in viral infection titer was confirmed for both the developed zinc oxide product and zinc oxide.

4. Future Development

This study was able to confirm the effect of zinc oxide on the COVID-19 virus. This indicates that it can inactivate or eliminate infectious viruses. Zinc oxide has the potential to further enhance the inactivating effect by changing its physical properties such as its particle size and crystal structure, and is considered to be a material that is expected to be put to practical use in various fields.

5. Inquiries

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