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Opinion Article

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Using Infrared Technology in Deactivate Viruses on Surfaces

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DESCRIPTION

This study characterized IR sources at different wavelengths and used a far infrared (FIR) source to kill viruses. FIR sources have been used in hospitals because they have therapeutic effects on the human body. Environmental factors including temperature, humidity, and ventilation have a significant impact on the transmission of viruses. The viability of viruses in stationary droplets as a function of relative humidity and temperature was studied using a set-up that included IR sources, an IR camera, an automatically regulated humidity chamber, and an airflow equipment.

This study indicates very effectively FIR inactivates viruses. For IR transmitted at a height of 1.4 m for three hours in a closed environmental chamber, the inactivation rate was 90% under 50% relative humidity, while it was 45.7% under an airflow rate of 0.20 m/s for ten minutes in open air at a height of 1.0 m. The recent SARS-CoV-2 outbreak highlights the possibility of future epidemics. In these cases, it is crucial to make sure that the pandemic is stopped with the least possible negative consequences. Such epidemics are influenced by a variety of variables, with climate playing a significant role in the coronavirus's transmission extensive research have studied into how temperature and humidity effect the rise and fall in infectious disease transmission rates in relation to climatic conditions. The primary premise of this study is that respiratory viral infections grow or decrease in accordance with changes in humidity, temperature, and season. According to earlier studies, influenza viruses have a low inactivation rate, making them more resilient in cold, dry, or extremely humid environments.

The SARS-CoV-2 virus will not survive without a living host (host). If it is to spread, the environment must be suitable. Most viruses are significantly degraded, or inactivated, under medium humidity (40%rh to 60%rh), but they can survive in both extremely high (84%rh and above) and low (30%rh and below) humidity levels (rh) conditions between 14 °C and 34 °C, the virus's ability to infect cells falls dramatically. This implies that there is a relation between temperature and virus inactivation. It is possible for infectious diseases to spread from one person to another by inhaling an aerosol, coughing or sneezing droplets, or by coming into touch with surfaces that have droplets on them (fomite). Microorganisms and human respiratory fluid are present in these droplets and aerosols.

The conditions for the virus to continue to be active are provided by the respiratory fluid. When released into the environment, respiratory

fluid from surface droplets or suspended particles may partially evaporate. The ambient conditions change as a result of water loss in the respiratory fluid and substances like proteins and sodium chloride. In this study, the virus was inactivated using the IR approach, which has no adverse effects and is safe for human health. We investigated at the usage of the IR technique because it is a safe technology that is utilized for therapy, even though that UV and chemical disinfectants such alcohol are more frequently used for inactivation. Despite utilising a substitute for SARS-CoV-2, the findings show that IR radiation can speed up the breakdown of enveloped viruses like SARS-CoV-2 outside of the host. The SARS-CoV-2 pandemic and future pandemics caused by respiratory viruses like influenza could be significantly impacted by the rapid decay of viruses because SARS-CoV-2 transmission and illness severity appear to depend on the viral load.