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Cold Atmospheric Plasma Devices for SARS-CoV-2 Sanitation on Solid Surfaces[1] LI LIN, KAREEM KABRA, XIAOLIANG YAO, CHRISTOPHER MORES, MICHAEL KEIDAR, George Washington University, MPNL TEAM, HIGH CONTAINMENT RESEARCH LABORATORY TEAM — It is well known that ultraviolet (UV) is able to damage both the protein capsid and nucleic acid of a virus. Based on that, cold atmospheric plasma (CAP) devices are thus potentially an effective broadband sanitation tool. Responding to the global COVID-19 threat, it is quite urgent to develop CAP devices with the following two features. First, considering the strong absorption of vacuum UV (VUV) of air, the discharge unit in the device has to be close to the target with a safety cover to prevent the side leak of VUV. In this study, we also summarized how UV in the air can generate reactive oxygen and nitrogen species (RONS) with the help of a strong electric field. Therefore, the RONS emission from the device may also deactivate the virus. Second, the device has to be mobile, easy to maneuver, and low-cost. Therefore, we developed several prototypes that are hand-held devices and powered by rechargeable lithium-ion batteries. Considering the shortage of consumables, such as ethanol, these electric-powered sanitation devices can be a good replacement for the liquid sanitation solutions.

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