

CONCURRENT SESSION 4 – COVID-19 DECONTAMINATION RESEARCH EFFORTS

Disinfection of N-95 Filtering Facepiece Respirators

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Problem Statement: The COVID-19 pandemic resulted in limited availability of personal protective supplies, including N-95 respirators. Many hospitals and health care professionals were required to reuse N-95 respirators without disinfection, which could result in contraction of the disease.

Until the COVID-19 pandemic, there had been little reason to disinfect disposable respirators. Now there are several ways that have been proposed to disinfect disposable N-95 respirators. This presentation will describe an efficacious method to disinfect N-95 respirators using commercial off the shelf equipment.

Approach: The methodology is based on research which demonstrated that low concentrations of hydrogen peroxide (HP) vapor held for a cumulative concentration-time of 50 ppm-hours were efficacious for inactivating MS2 and Phi6 bacteriophages, surrogates for viruses such as Ebola and SARS, on several materials, including N-95 respirators.

Twelve N-95 respirators were suspended inside a sealed plastic bin where hydrogen peroxide liquid was held in equilibrium with its vapor. A small fan was placed in the bin to help the process quickly reach equilibrium and to keep the HP vapor concentration constant throughout the bin. A one-dollar paper chemical indicator strip (the one item that is not purchased at a local store) provided a visual indication that the concentration-time was met for each disinfection cycle. At room temperature (21 °C), using 3% HP liquid, purchased at a drugstore, the process was completed in 24-hrs. Using 6% HP liquid, purchase at the beauty salon, reduced the required time to 12 hours (overnight). Real-time HP chemical sensors were also used to monitor HP vapor concentrations inside the bin during these tests.
