

Abstract Submitted
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Physical integrity analysis of Personal Protective Equipment (PPE) subjected to surface treatment by corona discharge generated Ozone MD ABDULLAH HIL BAKY, MIN HUANG, SHARIFUL ISLAM BHUIYAN, JAMIE KRAUS, Texas A&M University, HOWARD JEMISON, LTE Oil, DAVID STAACK, Texas A&M University — As the search for a vaccine for COVID-19 continues, many countries are still fighting the pandemic with increasing number of patients and deaths. A new challenge amid the effort to check the spread of the disease is shortage of personal protective equipment (PPE). Manufacturers are having hard time coping up with the demands. Therefore, PPEs are being treated with different disinfectants such as UV rays, hydrogen peroxide and ozone etc. Ozone is an effective oxidizer and have been practiced in the industry to kill microorganism. It is recommended that for a 4-log reduction of viral activity, ozone exposure of 40 minutes at 20ppm is required. However, over exposure to ozone might curtail the efficacy and damage the physical integrity of the PPE. In our study we have analyzed the durability of different PPE materials exposed to ozone for a different dose. AAMI gowns were exposed to 1799.4 and 3721.8 ppm-min for hydrostatic pressure testing and only failed at the later test. According to CDC, treated PPEs should be able to withstand a hydrostatic pressure of at least 0.7psi. But 3721.8ppm-min tested gown could hold a hydrostatic pressure of 0.6psi. Samples of AAMI gown and Polypropylene, Polyester, Tyvek Suite materials which make up for the N-95 mask and other PPEs were also treated up to varying ozone dose for wettability testing. No significant change in the water contact angle observed. SEM testing of Polypropylene and Polyester was also performed up-to 1247 ppm-min but no change in structure was noticed.

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