

PROTECTION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL PROTECTION

Multi-purpose High Air/water Permeable Membrane For Cbrn Protection

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As interest in chemical and biological warfare agents is rising, research to apply aerosol protection to protective clothing is being actively conducted. However, the vast majority focus on water vapor permeable membranes, not air permeable membranes. A filtering membrane without air permeability limits its practical usage in personal protective suits and masks. In this study, PAN membranes with anchored activated carbon and doped copper(II) oxide were prepared via simple electrospinning. The nanofibers with uniformly controlled diameter and smooth morphology enable the water/air breathability and protect aerosol threats containing 100 nm polystyrene nanobeads (similar in size to SARS-CoV-2). The uniformly distributed and tightly anchored activated carbon and doped copper(II) oxide enhanced the sorptive performance of the membranes for blocking gaseous CWAs, including soman, a nerve chemical agent, and BWAs. The dual-purpose membrane has a huge potential in applications such as protective equipment due to its performance and simple way to synthesis.

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