

PROTECTION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL PROTECTION

2D Melanin Coatings For Chemical Warfare Agent Protection

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The development of two-dimensional (2D) materials to rapidly degrade toxic chemicals and chemical warfare agents (CWAs) under a variety of environmental conditions and substrates offers advantages over other approaches. These materials, however, traditionally have been used as solid materials which limit the application on robust protective gear. We propose to use a hybrid material system that can incorporate a 2D version of melanin, the naturally occurring pigment, into an elastomeric material that can be applied by a variety of methods to numerous substrates to destroy CWAs effectively and provide a protective barrier. By utilizing a bio-derived 2D melanin material towards protection against CWAs, a low-cost, scalable, and highly-tunable composite has the potential to provide protection under a variety of conditions and on many substrates. We will discuss the recent finding and capabilities of our materials toward the development of an effective protective material.