Protecting Civilians and Public Service Personnel through an Early Identification and Warning System for Airborne Chemicals: SEIAC

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In this decade, airborne chemical exposure has catastrophically impacted thousands of lives. Whether this exposure is intentional or inadvertent, the outcomes have been devastating, causing long-term incapacitation and in many instances death. Many of these horrific consequences could be ameliorated if victims were provided an early warning prior to exposure to odorless, colorless airborne chemicals. The researcher was inspired to develop this device after seeing horrific scenes of children subjected to blistering, paralyzation, lung toxication and other anticholinergic reactions post chemical exposure. Additional inspiration stems from two family members who are at risk of chemical exposure through their occupations in public service. Research provides that this problem is not isolated to war-torn areas or laboratories where chemicals are used for experimentation, in fact, chemical exposure to civilian populations occurs globally on a regular basis. To solve this critical global issue, the researcher created novel, plasticized composites composed of a static amount of polypropylene and experimental amounts of activated carbon nanotubes to react with the test chemical Isopropyl Alcohol. After creating a successful composite, a prototype was created. The prototype accomplished all design criteria by incorporating biomimicry through canine olfaction, economic feasibility through a cost of $9.39, surface acoustic wave technology, and user-friendliness through the preliminary design of an application. The researcher hopes that this life-saving innovation can be deployed in the future in homes, hospitals, schools, subways, airports, and other public venues at risk of odorless and colorless airborne chemical exposure to people.

Awards Won: