

# New research creates neutralizing sponge for dangerous chemicals

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Dr. Simon Holder, Reader in Organic Chemistry at the University of Kent (UK) and Dr. Barry Blight, Associate Professor of Chemistry at the University of New Brunswick (Canada), have developed a new method

for containing and deactivating neurotoxic chemicals like VX and sarin.

These weapons, known as [nerve agents](#) or neurotoxins, are highly potent and fast acting. Small doses can cause rapid paralysis and death, as the chemicals disrupt the connection between the body's nerves and muscles.

These internationally banned liquids are aerosolised purposely to inflict damage on large geographical areas and are considered to be weapons of mass destruction (WMD's).

In a project funded by the Defense Science and Technology Laboratory (DSTL) of the UK Ministry of Defense, the Kent team investigated new methods of bulk decontamination of [chemical](#) weapons.

The result of the research was the "Metal-organic framework (MOF)-containing polymer sponge."

This is a sponge developed to swell and absorb dangerous neurotoxins and make them safer to handle, which also contains the MOF chemical catalyst, created to accelerate the chemical's breakdown, diminishing the neurotoxins into safer components.

To research this safely, researchers used substances to simulate the presence of neurotoxins without risking exposure to dangerous chemicals. Following this, DSTL tested the prototype material with the real nerve agent to confirm the effect.

"Less than five kilograms of the MOF-containing polymer sponge can absorb, immobilize, and safely destroy a 55-gallon drum of these toxic chemicals. It is very exciting to consider the potential this has in combatting dangerous chemicals in the future," said Dr. Holder, who is also director of research at Kent's School of Physical Sciences.

The [research paper](#) has been published in *ACS Applied Materials and Interfaces*.

**More information:** Yaroslav Kalinovsky et al. Swell and Destroy: A Metal–Organic Framework-Containing Polymer Sponge That Immobilizes and Catalytically Degrades Nerve Agents, *ACS Applied Materials & Interfaces* (2020). [DOI: 10.1021/acsami.9b18478](https://doi.org/10.1021/acsami.9b18478)

Provided by University of Kent

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