

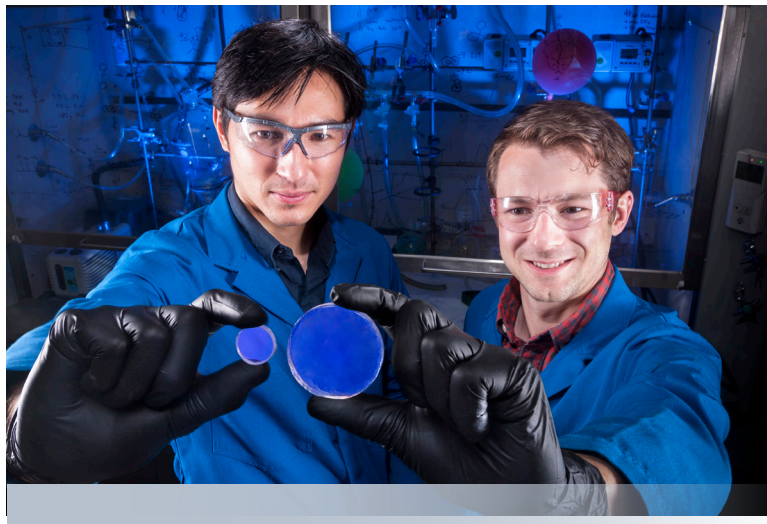
ORGANIC GLASS FOR RADIATION DETECTION

US Pat. No. 9,845,334 (additional patents pending)

Technology Readiness Level: 4/5

Key elements demonstrated in laboratory and relevant environments

Sandia National Laboratories developed an organic glass scintillator that will improve safety and security at our nation's ports and borders. Current radiation monitors typically utilize plastic scintillators, which are unable to differentiate between special nuclear materials and normal or non-threatening sources of radiation without a separate helium tube. The type of helium used in these tubes is rare and non-renewable, adding cost and complexity to the system. Sandia's organic glass scintillator provides detection capabilities that were limited to expensive, fragile *trans*-stilbene in a cheaper and more portable form.



Manufactured via melt casting, Sandia's organic glass scintillators consist of a combination of two organic compounds that resist crystallization and can be formed into almost any shape, including thin fibers. The resulting scintillator demonstrates high scintillation yields and discrimination between gamma rays (environmental radiation) and controlled threat materials such as plutonium or uranium with high selectivity. This material is also suitable for other applications that require high luminosity, high electron/hole mobilities, and stable film-forming properties such as organic electronics.

This new class of scintillation material outperforms *trans*-stilbene, the gold standard in radiation detection material, and is far quicker and easier to produce—making it a better option for incorporation in to detection devices used by our nation's security personnel and first responders.

TECHNICAL BENEFITS

- Light yields of up to 115% *trans*-stilbene crystals and better neutron/gamma pulse shape discrimination (PSD) performance
- Rapid, large-scale production
- Low cost
- Can be cast into nearly any shape
- Mechanically and physically stable

INDUSTRIES & APPLICATIONS

- Nuclear non-proliferation
- Border security
- Radiation physics
- Organic electronics

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