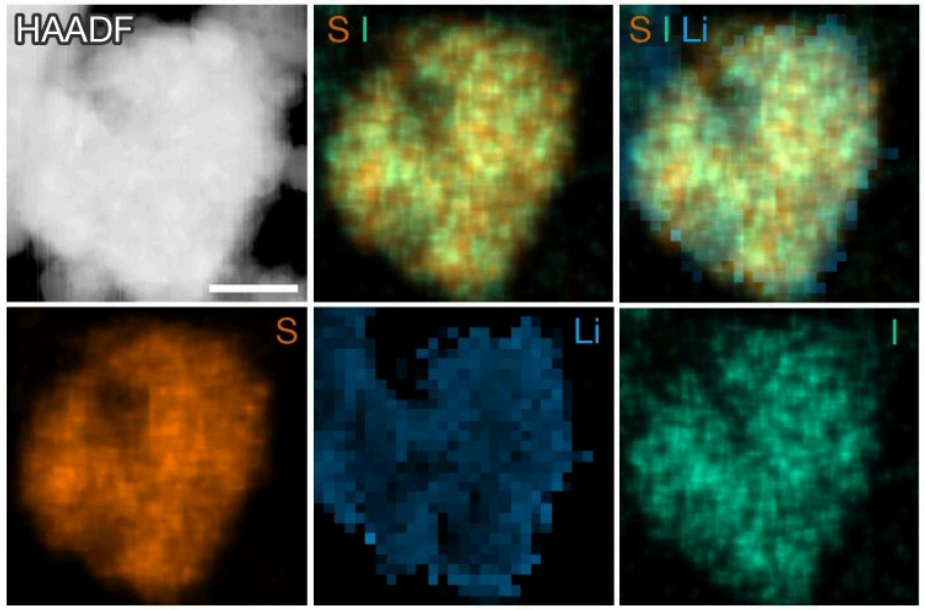
Sulfur Iodide Paves the Way for Cheaper, "Healable" Vehicle Batteries

7-BM QAS | 8-BM TES | 28-ID-2 XPD



Cryo-TEM HAADF (high-angle annular dark-field), EDX, and EELS mapping images of $S_{9.3}I$. The S and I maps are acquired using EDX, the Li map is acquired using EELS. The scale bar is 200 nm.

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Work performed in part at NSLS-II

National Synchrotron Light Source II

Scientific Achievement

By adding iodine (I) to a solid-state lithium sulfur (Li-S) battery (SSLSB), scientists yielded vastly improved conductivity and a low melting point that promotes self-repair of interfaces.

Significance and Impact

The results may help realize SSLSBs as a viable option for more cost-effective and robust electric vehicle batteries.

Research Details

- I_2 was inserted into the crystalline sulfur structure.
- Charging mechanisms of the $S_{9.3}I$ crystal were studied via X-ray absorption spectroscopy at NSLS-II's QAS and TES beamlines.
- The melting point was confirmed, in part, via in situ X-ray diffraction at NSLS-II's XPD beamline.
- Results showed magnitudes-greater conductivity versus S alone; the Li-$S_{9.3}I$ cell was stable over 400 charging cycles.

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