

## TITLE

# Lithium-Sulfur and Sodium-Sulfur Battery Cathodes

## CASE NUMBER

**C15250**

### VALUE PROPOSITION

- » The lithium-sulfur batteries have been shown to have an energy density over 3x the current lithium-sulfur batteries and ~5-6x better than other lithium batteries currently on the market.
- » These batteries also display a 33% higher energy density than the equivalent battery with defect free metal-organic frameworks.

### UNMET NEED

- » The batteries fueling portable electronic devices need to get smaller while still supplying the same or better lifetime per charge.
- » As electric vehicles become more mainstream, they will have to improve upon the range they can travel on a full battery charge (currently ~240 miles).
- » There is need for battery technology with higher energy density, lighter weight and better cycle life.

### TECHNICAL OVERVIEW

- » Johns Hopkins researchers have incorporated metal-organic frameworks with defects into the electrode of the battery.
- » These defects help retain the sulfur molecules in the electrode which retains the capacity of the battery.
- » These defects have also been functionalized to further improve the capacity of the battery.

### STAGE OF DEVELOPMENT

- » The inventors have made and tested these batteries as coin cell batteries and tested up to 20 cycles.

### ASSOCIATED INVENTORS

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Sciences*

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### TECHNOLOGY CLASSIFICATION

- » Energy
- » Engineering

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### ASSOCIATED REPORTS OF INVENTION (ROIs) AND INTELLECTUAL PROPERTY (IP) FILING NUMBERS

ROI#	TITLE	STATUS	PRIORITY DATE	IP FILING NUMBERS
C15250	Lithium-Sulfur and Sodium-Sulfur Battery Cathodes	Pending	4/30/2018	<u>U.S. Patent Publ. US-2021-0408549</u>