TITLE

Pulsed Electrochemical Deposition of Ordered Intermetallic Carbon Composites for Advanced Electrocatalytic Applications

CASE NUMBER

C16027

VALUE PROPOSITION

» The inventors' method can be used to prepare metastable and equilibrium phases of metal salts onto carbon in a single step.

UNMET NEED

» Fuel cells require high loadings of precious metals such as Pt and Pd to support catalytic activity and stability of the cell, but metastable alloys have recently emerged as high-performance catalysts.

» There is a need for a method of manufacturing nanostructured metastable ordered intermetallic compounds for use in fuel cells.

TECHNICAL OVERVIEW

» The inventors have developed a method for synthesizing sub-15 nm metastable ordered intermetallic Pb31Bi12 nanoparticles.

» They can be synthesized at room temperature, in a single step by pulsed electrochemical deposition onto high surface area carbon supports.

» Current techniques utilize high temperature annealing to decompose metal salts onto carbon supports, but this method is slow and only equilibrium phases are usually accessed.

STAGE OF DEVELOPMENT

» A proof of concept study has been completed.

ASSOCIATED INVENTORS

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TECHNOLOGY CLASSIFICATION

» Electrical Engineering

» Engineering

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JOHNS HOPKINS
TECHNOLOGY VENTURES

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

ROI#	TITLE	STATUS	PRIORITY DATE	IP FILING NUMBERS
C16027	Pulsed electrochemical deposition of ordered intermetallic carbon composites for advanced electrocatalytic applications	Pending	11/22/2019	US Publ. No. 2023/0006218