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Solar Energy Assisted Water Purification: Incorporation of an Environmentally Benign Porous Graphitized Carbon Nitride Photocatalyst with Graphitized Polyacrylonitrile for Efficient Oxidation of Toxic Arsenite STEPHANIE RICHINS, LARA TEICH, None, CHEMICAL MATERIAL ENGINEERING COLLABORATION — The presence of arsenic in New Mexico water bodies is a concern. It is urgent to develop processes for its removal. Recently, graphitized carbon nitride g-C_3N_4 with proper bandgap (2.7 eV) has attracted attention. However, the efficiency for g-C_3N_4 needs improvement due to its low charge separation efficiency and low surface area. Polyacrylonitrile (PAN) is an inexpensive polymer. When heated, it forms graphitized g-PAN with graphite-like sheet network structure, which should facilitate the charge separation efficiency and increase the surface area of g-C_3N_4. In this work, we report the synthesis of g-C_3N_4 and its composites with g-PAN with different compositions. Characterization including BET surface area, morphology, crystal structure, microstructure by N_2 adsorption/desorption, electron microscopies, and x-ray diffraction. The photocatalytic oxidation of As(III) under visible light irradiation as a function of the percentage g-PAN in g-C_3N_4 is evaluated. The correlation between photocatalytic performance with composition, microstructure, and surface area will be discussed.

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None

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