

APS March Meeting 2019

Volume 64, Number 2

Monday–Friday, March 4–8, 2019; Boston, Massachusetts

Session B47: Catalytic Energy Generation

11:15 AM–2:03 PM, Monday, March 4, 2019

BCEC Room: 213

Sponsoring Unit: GERA

Chair: Filip Podjaski

Abstract: B47.00004 : Characterization of Platinum Nanoparticles Utilized in Photocatalytic Hydrogen Synthesis*

11:51 AM–12:03 PM

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Hydrogen (H_2) gas is a possible alternate fuel to help meet increasing worldwide energy needs, but a major obstacle in the use of H_2 for green, environmentally-friendly fuel is the energetic and chemical requirements to synthesize the gas. We are studying the use of photocatalytic reactions to produce H_2 , where a light-absorbing substance acts as a catalyst in shuttling electrons from a donor to protons that are reduced into H_2 . Previous research conducted at BYU showed that platinum nanoparticles bound to ferritin catalyzed the photoreaction of methyl viologen to reduce protons in an organic acid offered an increase in hydrogen production efficiency by up to 100 times over platinum black (a commonly available platinum-based catalyst). We are reporting on our efforts to optimize the synthesis of the platinum nanoparticles bound to ferritin that are used in this photocatalytic system and how we characterize these nanoparticles, as well as how these characteristics affect H_2 production.

*We'd like to thank the Brigham Young University Physics Department and the National Science Foundation (grant no. 1757998) for their generous funding.