

Abstract Submitted
for the OSF16 Meeting of
The American Physical Society

Hot-injection Colloidal Synthesis and Characterization of Nanocrystalline Marcasite Iron Ditelluride FeTe_2 EBIN BASTOLA, KHAGENDRA BHANDARI, RANDY ELLINGSON, Center for Photovoltaics Innovation and Commercialization (PVIC), Department of Physics and Astronomy, University of Toledo — Colloidal semiconductor nanocrystalline (NC) materials are promising functional materials for advanced opto-electronic applications. Iron dichalcogenide nanocrystals such as iron pyrite (FeS_2) have been successfully applied as hole transport material to enhance the performance of solar cells. Here, we report a hot-injection colloidal synthesis of NC iron ditelluride (FeTe_2) using iron (II) bromide as an iron source and elemental tellurium (Te). The synthesized NC FeTe_2 are characterized by using X-ray diffraction (XRD), scanning electron microscopy (SEM) imaging, energy dispersive X-ray spectroscopy (EDS), and Raman spectroscopy. These NC FeTe_2 exhibit orthorhombic crystal structure in marcasite phase. The SEM images show irregular shape and size, and based on the EDS analysis, the average atomic ratio of tellurium (Te) to iron (Fe) is 2.04. Additionally, we discuss optical and electronic properties of thin films of these as-synthesized NC FeTe_2 and its possible application.

Center for Photovoltaics Innovation and Commercialization (PVIC), Department of Physics and Astronomy, U

Date submitted: 05 Oct 2016

Electronic form version 1.4