

Abstract Submitted
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Nitric-phosphoric acid etching effects on the surface chemical composition of CdTe thin film. IRFAN IRFAN, HUANJUN DING, Department of Physics and Astronomy, University of Rochester, WEI XIA, HAO LIN, CHING W. TANG, Department of Chemical Engineering, University of Rochester, YONGLI GAO, Department of Physics and Astronomy, University of Rochester — Nitric-phosphoric (NP) acid etching has been regarded as one of the most successful methods for the formation of low resistance back contact with the metal electrode in CdTe based solar cells. We report back surface chemical composition for eight different durations of NP etching of CdTe polycrystalline thin film. We studied the surfaces with x-ray photoemission spectroscopy (XPS), ultraviolet photoemission spectroscopy (UPS), inverse photoemission spectroscopy (IEPS) and atomic force microscopy (AFM). Etching dependence on the back surface composition and electronic structure was observed. Valence and conduction band shifts relative to the Fermi level of the system with different etching duration were analyzed. The sample was left in open ambient condition for three weeks and XPS data were obtained again in order to study the difference in surface chemical composition with the pristine CdTe film. Unetched and highly etched part of the sample were sputtered and the depth profile analyzed.

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