Characterization of CdTe films deposited at various bath temperatures and concentrations using electrophoretic deposition.

ABSTRACT

CdTe film was deposited using the electrophoretic deposition technique onto an ITO glass at various bath temperatures. Four batch film compositions were used by mixing 1 to 4 wt% concentration of CdTe powder with 10 mL of a solution of methanol and toluene. X-ray Diffraction analysis showed that the films exhibited polycrystalline nature of zinc-blende structure with the (111) orientation as the most prominent peak. From the Atomic Force Microscopy, the thickness and surface roughness of the CdTe film increased with the increase of CdTe concentration. The optical energy band gap of film decreased with the increase of CdTe concentration, and with the increase of isothermal bath temperature. The film thickness increased with respect to the increase of CdTe concentration and bath temperature, and following, the numerical expression for the film thickness with respect to these two variables has been established.

Keyword: Electrophoretic deposition; Cadmium telluride; Optical properties; Numerical expression.