$CdS_xSe_{(1-x)}$ ternary compounds have been grown at 170°C using electrodeposition from an ethylene glycol solution. The materials were grown for x = 0, 0.22, 0.50, 0.76 and 1.00, and the x values quoted here are obtained from the XRF measurements. The resulting materials were characterized by optical absorption method for band gap variation and photoelectrochemical cell for the photoresponce studies. It has been demonstrated that the band gap could be varied from 1.7 eV for x = 0 (CdSe) to 2.4 eV for x =1 (CdSe) by varying the parameter x. Photoelectrochemical studies on these samples confirm the band gap variation observed in optical absorption studies. Also they demonstrate that CdS is more efficient in energy conversion at blue-end of the solar spectrum, and CdSe is efficient in the red-end.