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Depletion Layer Parameters of Al-MoO3-P-CdTe-Al MOS Structures

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Abstract : The Al-MoO3-P-CdTe-Al MOS sandwich structures were fabricated by vacuum deposition method on cleaned glass substrates. Capacitance versus voltage measurements were performed at different frequencies and sweep rates of applied voltages for oxide and semiconductor films of different thicknesses. In the negative voltage region of the C-V curve a high differential capacitance of the semiconductor was observed and at high frequencies (<10 kHz) the transition from accumulation to depletion and further to deep depletion was observed as the voltage was swept from negative to positive. A study have been undertaken to determine the value of acceptor density and some depletion layer parameters such as depletion layer capacitance, depletion width, impurity concentration, flat band voltage, Debye length, flat band capacitance, diffusion or built-in-potential, space charge per unit area etc. These were determined from C-V measurements for different oxide and semiconductor thicknesses.

Keywords : debye length, depletion width, flat band capacitance, impurity concentration
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