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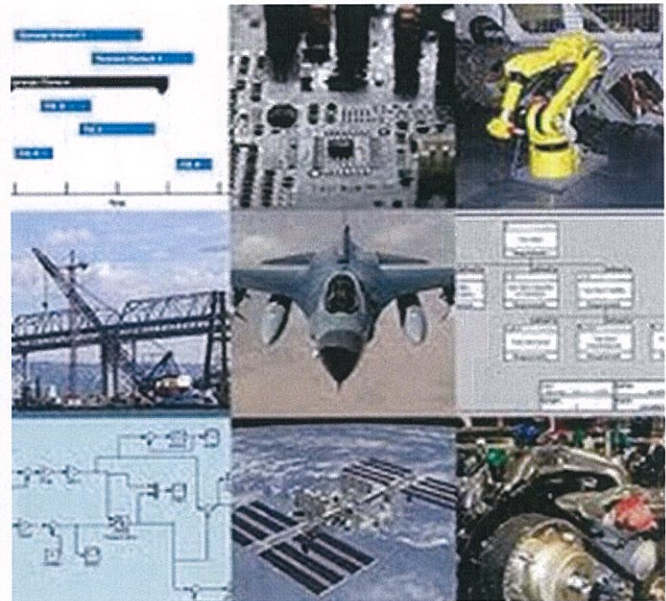
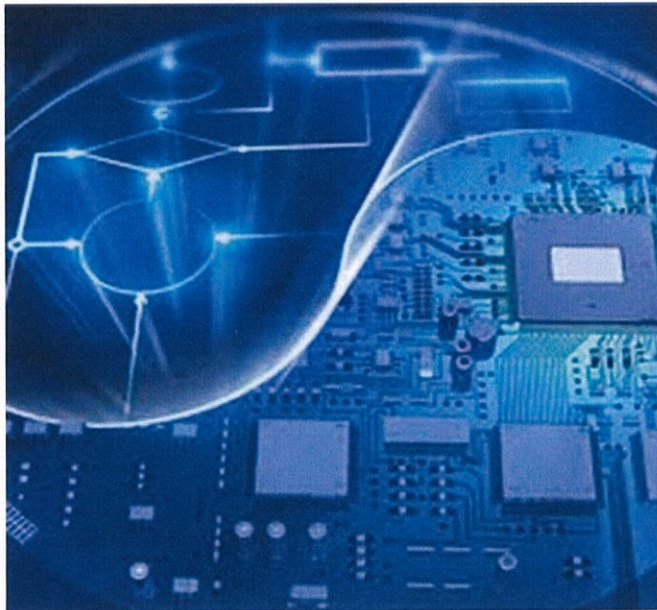


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Synthesis and Characterization of MoTe₂ Thin Films for Photoelectro-chemical Cell Applications

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Abstract - Thin films of transition metal chalcogenides, molybdenum ditelluride (MoTe₂) have been electrodeposited cathodically on indium tin oxide-coated conducting glass substrates from ammoniacal solution of H₂MoO₄ and TeO₂. These MoTe₂ thin films are useful as photovoltaic cell and photoelectro-chemical (PEC) solar cell. The electrode potential was varied while the bath temperature was maintained at 40±1 °C and deposition time of 30 minutes. X-ray diffraction analysis showed the presence of highly textured MoTe₂ films with polycrystalline nature. Compositional analysis by EDX gives their stoichiometric relationships. Scanning electron microscope (SEM) was used to study surface morphology and shows that the films are smooth, uniform and useful for device fabrication. The optical absorption spectra showed that the material has an indirect band-gap value of 1.91-2.04 eV with different electrode potential. Besides, the film exhibited p-type semiconductor behavior.