

Process Engineering of Low Temperature Chemical Bath Deposition Technique for Flexible Electronics

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Chemical Bath Deposition (CBD) has been primarily used in the process of fabricating Cu (In, Ga) Se₂ and CdTe based thin film photovoltaics. Normally carried out as a batch process, the most significant feature of CBD is its ability to be carried out under low temperature (near room temperature). But a major drawback of batch CBD is the formation of particles which generates a lot of waste and creates defects in devices. Moreover, it is necessary to better understand the role of particle formation and deposition in CBD thin film growth process. We have developed an impinging flow microreactor for CBD. This novel reactor provides the capability to control the homogeneous chemistry before impinging on the substrate thus helps us in differentiating the molecule-by-molecule growth from the cluster-by-cluster growth. Working Metal-Insulator Semiconductor Field Effect Transistors (MISFET) on rigid and polymeric substrates (Polyimide and PET- Poly(ethylene terephthalate) using a CBD deposited compound semiconductor channel layer were fabricated from both conventional and this new reactor.