Flame Synthesized Metal Oxides Thin Films by Using Metal Wire as Precursor

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In this work, metal wire has been used as precursor. A methane-oxygen premixed flame as energy source vaporized metal wire gradually, which oxidized to metal oxide in the oxygen-excessive flame downstream. Metal oxide thin films with one-dimentional morphology were deposited on both silicon substrate and ITO glass substrate. We investigated the effects of the various process parameters, such as metal wire position in between substrate and flame burner, deposition height, total gas flow rate and deposition time on resultant morphology and thickness of metal oxides thin films respectively. The structure properties were characterized by Scanning electron microscopy and X-ray diffraction. The photoelectrochemical properties were also tested by IPCE measurement system.