

Fabrication and Characterization of Mono-dispersed Catalytic Metal Films Using Electrostatic Spray Deposition

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Studies have shown that electrostatic spray deposition (ESD) method is suitable to produce different thin monolithic or composite metal oxide films [1] at low operating temperatures (i.e. 250 °C). In this work and as part of the Solar Hydrogen Project at IIT, the ESD method is used to synthesize mono-dispersed thin films of metal catalysts such as nickel, cobalt, and iron. The thin film catalysts will be utilized to produce carbon nanotubes (CNTs) for hydrogen storage by thermal chemical vapor deposition (TCVD) method [2].

ESD parameters such as deposition time, flow rate, spacing, and voltage are investigated to obtain good adhesion and film properties with optimum operating conditions. Characterization techniques such as Raman Spectroscopy and X-Ray Diffraction will be used to examine the micro-structural properties of the catalyst and to identify transition phases and impurities.

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References:

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