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Floating catalyst CVD synthesis of SWNTs from hydrocarbons

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We report recent studies on the SWNT floating catalyst CVD synthesis from hydrocarbon precursors. Ferrocene vapour was used as the source of Fe catalyst particles with CO or Ar as the carrier gas and H₂ as the trace gas. Ethylene and methane were used as the carbon source gases. SWNTs were characterized optically with absorption and Raman of thin films. The sheet resistance was determined with the four probe method. HRTEM at 80 kV operation voltage was used to observe the tube and catalyst particle diameter distributions as well as the number of graphene layers at the catalyst surface. We present the effects of reactor temperature as well as ethylene and hydrogen concentration on the tube characteristics. In addition, we explore the SWNT – graphene coated Fe nanoparticle hybrids as electrocatalysts in oxygen and hydrogen evolution reactions. Finally, we present recent ETEM movies on individual SWNT growth from MgO supported Co catalysts in low pressure ethanol vapour.



主催：

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