

## عنوان مقاله:

Gold-decorated sulfur-doped carbon nanotubes as electrocatalyst in hydrogen evolution reaction

## محل انتشار:

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## خلاصه مقاله:

In the present work, sulfur-doped carbon nanotubes (SCNTs) have been prepared using chemical vapor deposition method and various cobalt-containing catalysts. In this line, simple and silica-supported cobalt nanoparticles (Co and Co/SiO<sub>2</sub>) and  $\delta$  cobalt spinels (MCo<sub>2</sub>O<sub>4</sub>, M= Ni, Cu, Mn, Fe, Cr, and Mg) were used as the growth catalysts and four different temperatures (۶۰۰, ۶۵۰, ۷۰۰, and ۷۵۰ °C) were used to obtain the optimized condition for the preparation of SCNTs. Among the employed catalysts, Co/SiO<sub>2</sub> at ۶۰۰ °C showed the higher abilities for the preparation of desired SCNTs. All products were characterized using FESEM, EDS, XRD, Raman, static contact angle, TGA, and DTA analyzes. The electrochemical behaviors of the two best products (SCNTs-Co/SiO<sub>2</sub> and SCNTs-Co) in hydrogen evolution reaction (HER) were examined, which confirmed the higher ability of SCNTs-Co/SiO<sub>2</sub>. This best product was decorated with ۲, ۵, and ۱۰% of gold nanoparticles to examine the effect of gold decoration of the properties and electrochemical abilities of the product. All decorated products exposure the higher electrochemical potencies versus the simple SCNTs and among the decorated products, ۱۰% Au-SCNT was the most appropriate product for this purpose with small differences with the other once.

## کلمات کلیدی:

CNT, Doping, Decoration, Gold, Surface, Electrocatalyst

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