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Direct synthesis of colored SWNT thin films

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We report recent studies on the direct synthesis and deposition of colored SWNT thin films using floating catalyst CVD synthesis. Ferrocene vapor was used as the source of Fe catalyst particles with CO used both as the carbon source and the carrier gas. The FC-CVD reactor was operated at the 820 °C temperature. When CO₂ concentration was controlled from 0 to 1 vol. 1%, the corresponding SWNT mean diameters ranged from 1.25 to 2.1 nm. When the CO₂ concentration was 0.2 vol. %, the tube mean diameter was 1.35 nm, and corresponding film was green, which color changed via brown to grey when further increasing CO₂ concentration and accordingly the tube mean diameter. We interpret the observed color changes based on the shape of the absorption spectrum in the visible wavelength range. Also, we present the corresponding sheet resistance and absorption at 550 nm as well as the effect of AgCl₂ doping on the film conductivity when changing the tube mean diameter and film thickness.



主催:

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