以常壓熱化學氣相沉積法成長奈米碳管之研究

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摘 要

本研究以常壓熱化學氣相沉積法(atmospheric thermal CVD) 成長奈米碳管。藉溶膠-凝膠法(sol-gel)將觸媒先驅物旋轉塗佈於矽基板，經由線上還原，(In-Situ eduction)以化學氣相沉積法成 長奈米碳管。由我們的研究可觀察到幾個現象：⑴前處理時間、 氣體流量、溫度、氣體種類、混合比等參數可用以控制奈米碳管之 直徑，⑵800℃ ~ 900℃ 之前處理溫度有利於奈米碳管之成長， ⑶以氨氣作為前處理之氣體比氫好，⑷700℃ ~ 900℃ 之溫度有 利於奈米碳管之成長，⑸添加氫氣比不添加時，可以成長更完美 型態的 CNT，⑹氫氣、乙炔混合比例相當時有利於奈米碳管之成 長，⑺添加氫氣，作用時間約10-20分鐘後有利於奈米碳管之成 長，⑻如要控制奈米碳管之成長方向，未來可能需瞭解氨氣、氫 氣和乙炔流量之效應。

關鍵詞 : 觸媒，化學氣相沉積法，奈米碳管

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