熱化學氣相沉積奈米碳管之前處理與後處理技術

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摘 要

為了研究奈米碳管表面結構對場發射特性之影響，我們使用氮基氣體對催化劑金屬前處理、電漿對奈米碳管後處理以及酸性化學溶液對奈米碳管做後處理等方法，目的是為了修飾奈米碳管的表面型態及改變炭奈米管的表面結構，進一步增強奈米碳管的場發射特性。研究的過程中，利用掃描式電子顯微鏡(scanning electron microscopy, SEM)及穿透式電子顯微鏡(transmission electron microscopy, TEM)觀察催化劑金屬顆粒的大小，及觀察碳管的表面形態及管壁結構，並使用拉曼頻譜(Raman spectroscopy)與能量散射光譜儀EDS(electron dispersive spectrometer, EDS)分析奈米碳管表面結構與組成成份的改變，從實驗數據清楚的顯示使用氮基氣體對催化劑金屬前處理、電漿對奈米碳管後處理以及酸性化學溶對奈米碳管做後處理等三種處理方法，可以有效的增強奈米碳管的場發射特性。場發射特性增強的主要原因為奈米碳管經前處理及後處理過後，碳管的表面結構產生改變，造成場發射點數目的增加及表面功函數的降低。

關鍵詞 : 奈米碳管、場發射

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