國立台灣大學技術行銷表

台大案號:_____(由產學組填寫)

產學合作中心聯絡人：　　電話：　　e-mail：

產品/技術名稱	新型聚亞醯胺以分散銀粒子及碳管並應用於薄膜導電性
發明人/單位	林江珍教授/台灣大學 高分子科學與工程學研究所
產品/技術說明	本發明為合成一新穎性高分子材料(聚醚胺與 dianhydride 經二段加熱法合成)。其組成份(poly(oxyethylene)-imide (POE-imide))具新穎性。此有機材料可用於分散銀粒子與奈米碳管於水中及有機溶劑中。除此之外，此 POE-imide 可作為一還原劑還原金屬離子成粒子，故新組成之 POE-imide@Ag@CNT 材料被開發。透過此有機材料，不僅大幅提升 CNTs 在溶液中的分散性且使銀離子被還原成銀粒子(nanometer scale in diameter)，均勻且穩定地分布在 CNTs 上，進一步經過熱處理後(>150 ^{o}C)，可得到表面具導電性(>10^{0} S/cm)之薄膜。另外，此 POE-imide@Ag@CNT 溶液亦可經由離心及抽乾方式得到單一之 AgNPs@CNTs 複合物或 paste，並可再分散至水或有機溶劑中。此方式合成之 AgNPs@CNTs 因 POE-imide 為雙性性質。
應用範圍	抗菌材料、機能性紡織品、塗料、醫療材料、奈米導電銀管、碳管/銀漿、及複合材料等高附加價值產品
產品/技術優勢	新穎製程、製程簡易、具高導電性
市場潛力	Carbon Nanotechnologies Inc. (CNI)預估，奈米碳管市場每年可達 1000 億美元。目前分散奈米碳管還是著重化學改直碳管，此方法步驟繁雜且亦造成碳管性能降低，若能使用簡易之方法進而分散奈米碳管，除可降低成本且更有利後續之應用。
產品/技術 智財權保護方式	（由技轉組填寫）

Marketing Abstract of NTU's Invention Disclosure

NTU's docket no:_____(由技轉室填寫)

TTO contact：　　Tel：　　e-mail：

Title	Poly(oxyalkylene)-imide as dispersants for dispersing silver nanoparticle and MWNT Nanohybrids in aqueous or organic solvents and their conductive Films
Inventor (s)	Prof. Jiang-Jen-Lin/ Institute of Polymer Science and Engineering, National Taiwan University
Brief Description	Nanohybrids of AgNPs (8–30 nm) decorated on the surface of MWNTs (Ag@MWNT) were synthesized via in situ method. The process required the presence of a POE-imide, which promoted dispersion of the MWNTs and reduced the Ag^{+} to Ag^{0}. By simple coating on glass slide and heating to 170 ^{o}C, the mixture of Ag@MWNT subsequently was shown to have a high electric conductivity (2 x 10^{3} S/cm). Furthermore, the single tube of Ag@MWNT nanohybrid was further achieved by removing with the POE-imide and free AgNPs
Fields of Application	Anti-microbial, coating, materials for medical use, electric silver nanotube, nanocomposites with high added value.
Advantage	Novel procedure, simple and easy manufacturing process, high electric conductivity
Market Potential	Carbon nanotubes were estimate to possess U.S. 1,000 hundred million dollars by Carbon Nanotechnologies Inc. (CNI). In the literatures, the majority of methods for enhancing CNT solubility have involved chemical bond modifications. However, such covalent modifications unavoidably damage the CNTs surface structure, may reduce the aspect ratio and consequently degrade their intrinsic properties and values. In the future, using simple dispersed technology, it will reduce the cost and be advantageous for industrial applications.
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