

Immobilization of mono- and di-hydroxy dibenzo-14-Crown-4 ethers on Single Walled Carbon Nanotubes by epoxide ring opening for the recovery of Lithium Ions

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Mono and di-hydroxyl dibenzo-14-Crown-4 ethers were covalently attached on carbon nanotubes (SWCNTs). The SWCNTs was sonicated in acid to produce carboxylated SWCNTs (SWCNTs-COOH). Further functionalization of SWCNTs-COOH with diglycidyl ethers formed epoxidized SWCNTs (SWCNTs-Ep). Covalently attached mono and di-hydroxyl dibenzo-14-Crown-4 ethers (SWCNTs-DB14C4) were produced by ring opening of the epoxide groups. The SWCNTs-DB14C4 was tested for lithium ion recovery in water. The degree of carboxylation in SWCNTs-COOH was confirmed by the formation of dodecylamine zwitterions. SWCNTs-Ep and SWCNTs-DB14C4 were characterized by FTIR, TGA, elemental analysis, solid state NMR, and TEM analysis. This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Ministry of Science, ICT & Future Planning (No. 2012R1A2A1A01009683) and the Ministry of Education (No. 2009-0093816).