

Simultaneous Separation of High-Purity Semiconducting and Metallic CNTs by SDS Concentration Controlled Gel Chromatography

안효정, 유예진, 김우재[†]
이화여자대학교
(wjkim1974@gmail.com[†])

Current technology synthesizing single-walled CNTs (SWCNTs) only produce mixtures of metallic and semiconducting CNTs. A gel chromatography method of separating metallic and semiconducting CNTs utilizing a relative difference in binding force between a surfactant-CNT and a gel using a size exclusion column has been widely investigated due to their easiness in separation and scalability. However, at the optimum surfactant concentration for high-purity separation of semiconducting CNTs, the separation purity of the metallic CNTs is reduced, that either the metallic CNTs or the semiconducting CNTs can be obtained with high purity using single surfactant concentration. This study presents a new method for simultaneous high-purity separation of semiconducting and metallic CNTs. High-purity semiconducting CNTs were first obtained with high surfactant concentration aqueous dispersions, then the eluted solution's surfactant concentration is lowered by dialysis/dilution to perform consecutive column chromatography to separate highly pure metallic CNTs.