

Synthesis and characterization of ferrocene containing polymers for RRAM application

유정현, 류원선*, 이태근, 양윤아
홍익대학교
(wsryoo@hongik.ac.kr*)

A number of ferrocene-containing polyfluorene were successfully synthesized as new self-doped polymer materials. Chemical structures and electrochemical behaviors of these compounds were investigated using several spectroscopic methods. The synthesis of these compounds was achieved using the Suzuki-Miyaura coupling reaction in biphasic mixture of toluene and sodium carbonate solution at 110 oC. The redox properties of the compounds have been investigated by cyclic voltammetry at ambient temperature using tetra-n-butylammonium perchlorate (TBAP) as the supporting electrolyte compared to ferrocene. We determined the dependence of electron transport properties in solid compounds on their redox states by measuring the current through the molecules as a function of the electrode potential and the ratio of ferrocene-to-fluorene unit. The current-voltage(IV) characteristics showed non-ohmic behavior, and the conductance increased with an increase in electric field between electrodes. We attribute the increase in conductance with potential to the switching of the molecules from low-conductance reduced state to high-conductance oxidized state.