Functional Nanocompositie Multilayers Using Nucleophilic Substitution Reaction-Based Layer-by-Layer Assembly Method

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In this study, iron nanoparticles/poly(amidoamine) dendrimer (PAMA) nanocomposite multilayered films were successfully generated via nucleophilic substitution-based LbL assembly in organic solvents. These films showed highly improved magnetic properties compared to those obtained by electrostatic LbL assembly. Of particular importance, the resulting nanocomposite multilayered films showed better nonvolatile resistive switching memory (NRSM) performance without an additional process (i.e., thermal treatment) after multilayer preparation, including a large current ON/OFF ratio of ~103, operating voltage < 1.5 V, rapid switching speed on the nanosecond level and long-term stability in air.