Deep-Blue Fluorescent Particles via Microwave Heating of Polyacrylonitrile Dispersions

This study presents a new method to produce fluorescent particles. Established methods are based on the incorporation of conjugated dye molecules into dielectric polymer matrices or preparation of colloids, which are composed of fluorescent conjugated polymer. By contrast, this study presents a method where dielectric polyacrylonitrile is exposed to microwave radiation leading to an intramolecular cyclization reaction producing π-conjugated segments, which fluoresce blue. During this conversion, the particles shrink in diameter but as an ensemble they retain their monodispersity. This work investigates the optimal reaction conditions and characterizes the optical properties.