Polymeric materials in dye-sensitized solar cells

박태호*
포항공과대학교 화학공학과
(taihopark@postech.ac.kr*)

Solid materials are encapsulated by a polymer membrane in a wide range of applications, including in solid-phase resins for the synthesis of combinatorial libraries, immobilized catalysts for chemical production, protective coatings for cell and tissue encapsulation, and vehicles for local drug delivery. Current options for encapsulation include droplet generation or coacervation, emulsion formation, polyelectrolyte multilayering, and direct surface-induced polymerization. Among them, the surface-induced polymerization, initiated by reactive species anchored to a nanoparticle surface via chemi- or physisorption, is very useful method as this method generates particles having brush-type polymer chains bound to the particle surfaces. The presence of an additional cross-linker yields surface-induced cross-linking polymerization and provides a more robust dense polymer film in a controlled manner. In this talk, we discuss the selective ion transfer by tunable nanoporous network polymer membrane nanocomposites and the effect of pore sizes in the nanocomposites on diffusion of I3-. The nanoporous network polymer membrane having different pore sizes were grown on the surfaces of dye-sensitized nanocrystalline TiO2 particles via the surface-induced cross-linking polymerization.