

## Hierarchical Transformation in 1D Nanohybrids and Their Application in Electrochemistry and Separation

박호석, 최봉길, 홍원희\*  
한국과학기술원  
(whhong@kaist.ac.kr\*)

Intermolecular interactions at the crucial interface are a key topic in nanoscience and nanotechnology due to the emergence of intriguing phenomenon such as self-assembly and nano-confinement. In this work, we first examined both room temperature ionic liquid (RTIL)-induced shape formation (RISF) mechanism and nano-confinement effect induced by intermolecular interactions between RTILs (acting as template and confined-fluid) and aluminum hydroxide crystallites (acting as building blocks and pore walls), employing a 2D IR correlation spectroscopy (COS). This method offers a new way to interpret highly complex, veiled systems such as the formation mechanism of nanoparticles, biomineralization, self/supramolecular assembly, and nano-confinement. The tune in the molecular structures, morphologies, and phases of nanohybrids via hierarchical transformation is of prime importance in not only designing the nanostructures of functional materials but also expanding the gallery of nanohybrids for applying nanopowder to a fixed bed in separation and thin film to a proton conductor in an electrochemical device.