이산화탄소와 올레핀 분리를 위한 신개념 나노복합체 분리막(Novel nanocomposite membranes for CO_2 and olefin separation)

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We report a novel polymer/metal nanoparticles/electron acceptor composite membrane for facilitated olefin transport and ionic liquid/Cu nanocomposite membrane for CO_2 separation. The electronic structure of the metal nanoparticles such as AgNP and Cu NP surface was tuned by the electron acceptor *p*-benzoquinone (*p*-BQ) and ionic liquid to induce positive charges on the surface. The chemically activated metal surface is expected to form complexes with olefin or CO2 molecules, resulting in gas carrier for facilitated transport. Such facilitated transport membranes were applied for separation of olefin/paraffin or CO_2/N_2 mixtures. In particular, the interaction between gases and the polarized surface of metal NPs in a permeable polymer matrix or ionic liquid was expected to show excellent separation performance with long-term stability.