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Synthesis of polyamidoamine hydrogel particles for environmental applications

Highly branched structures with a large number of functional groups of poly(amidoamine) (PAMAM) dendrimers and hyperbranched polymers make these materials very useful in many applications including host-guest encapsulation, nanoreactors, and delivery devices. We used both the advantages and limitations of A_2+B_4 polycondensation method to make hyperbranched PAMAM hydrogel particles. Aqueous solution of hyperbranched PAMAM precursors was prepared by slow addition of A_2 monomer, N,N'-methylenebisacrylamide, to aqueous solution of B_4 monomer, ethylenediamine. And then the aqueous solution of hyperbranched PAMAM precursor was dispersed in a hydrophobic liquid and the A_2+B_4 polycondensation proceeded until the critical gelation point. This simple method allowed us to make micro-sized hydrogel particles which wholly consisted of hyperbranched poly(amidoamine). The hyperbranched PAMAM hydrogel particles were found to be highly effective for the capturing of heavy metal ions from an aqueous solution and CO_2.

Biography

Sang Youl Kim is a Tenured Full Professor of Chemistry Department at KAIST. He has obtained his Master's degree at KAIST and his PhD at Rensselaer Polytechnic Institute. He did his Post-doctoral work at IBM Almaden Research Center, and then joined R&D of LG Chemicals. After three years of industrial research at LG, he has moved to KAIST in 1994. He served as the Department Head and as a Chairman of the Association of KAIST Professors. His research interests include new polymerization reactions and methods, polymeric materials with controlled architecture, design and synthesis of functional macromolecules, and self-assembled organic materials.

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