Self-coagulating polymer blend adsorbents for recovery of precious metal and removal of heavy metal ions

윤영상†, John Kwame Bediako
전북대학교
(ysyun@jbnu.ac.kr†)

Functional polymers such as polyethylenimine (PEI) and polyacrylic acid (PAA) possess lots of active groups able to bind charged species. However, the extreme hydrophilicity of these polymers renders them inapplicable to adsorption in aqueous phases without matrix supports. By combining the electrostatic chemical properties of these two polymers in different formulations, tunable adsorbents (PEI-PAA) were facilely fabricated in aqueous water without employing toxic organic chemicals. It was believed that PAA possessed inherent properties which enabled its self-coagulation with PEI, but not other similar polymers. Consequently, the adsorbents in the ratios of 4:1 and 1:4 (PEI:PAA) exhibited very high gold and cadmium adsorption capacities, reaching 1609.7 ± 89.6 and 646.1 ± 44.5 mg/g, respectively.