Nature-inspired nanotechnology: Environmental applications and implications

Eun-Ju Kim
Water Cycle Research Center, KIST (eunjukim@kist.re.kr)

Surface reactive phages of soils and aquifers, consisted of phyllosilicate and metal oxide minerals, play a significant role in the control of contaminant fate and transport. It is clear that an in-depth understanding of reactive minerals in soils and aquifers is necessary to design technologies for the remediation of soil and water resources. Iron and manganese represent abundant elements in Earth's crust. In our study, the role of iron and manganese minerals in water treatment and groundwater remediation is evaluated, and in particular the recent advances in sulfidation of iron-based materials are critically reviewed. Furthermore, we also focus on the toxicity of iron nanoparticles to representatives of various trophic levels, including bacteria and plants.