Biological Uranium Remediation

노창현*, Jonathan R. Lloyd[1]
한국원자력연구원; [1]School of Earth, Atmospheric & Environmental Sciences, The University of Manchester, UK
(chroh@kaeri.re.kr*)

The alpha emitter Uranium-238 (238U) is the most common isotope of uranium found in nature, and can be used as a source material for creating plutonium-239, which can in turn be used as nuclear fuel. The understanding of the microbial biotransformation of U (VI) to U(IV), producing the insoluble mineral uraninite, has been viewed as a potential mechanism for sequestration of environmental uranium contamination. Over the past decade, it has been established that a variety of bacteria exhibit this reductive capacity. Various aspects of the microbial process have been explored experimentally, to develop a practical approach for the acceleration of in situ bioremediation using this approach. The present review discusses the status of these microbiological processes, and the potential for cost-effective and scalable in situ remediation of radioactive waste.