Meetings International
SciTechnol

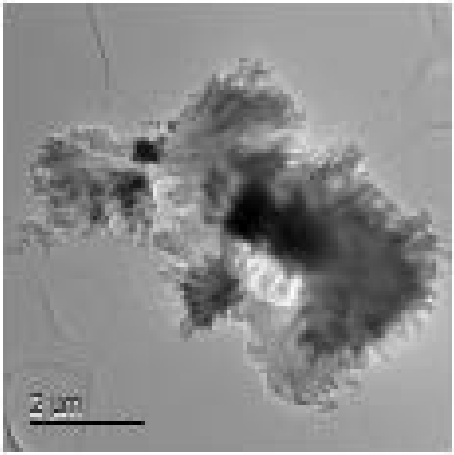
Ohnuki T, J Chem Appl Chem Eng 2019, Volume: 3
DOI: 10.4172/2576-3954-C1-013

4th International Conference on
MATERIALS CHEMISTRY & SCIENCE
&
5th International conference on
NANOTECHNOLOGY FOR RENEWABLE MATERIALS
March 18-19, 2019 | Singapore City, Singapore

Ohnuki T
Institute of Innovative Research, Japan

Biogenic minerals for removal of contaminants

One of the possible methods to eliminate 90Sr released by the Fukushima Daiichi Nuclear Power Plant (FDNPP) accident to environments is coprecipitation of Sr with carbonates minerals. Bacteria ureolysis is known to be able to in-situ eliminate Sr from groundwater by producing carbonates. We have studied the elimination of 90Sr from sea water into biogenic calcite1. A marine microbe of strain TK2d inoculated in the liquid medium contained (per L) 3.74 g Marine broth, 20 g urea, 30 g NaCl with 5.0, 1.0. 0.1, and 0.02 mM SrCl2. Sr2+ concentrations were monitored by ICP-OES (ICP-OES; 720 Agilent Technologies, Inc., USA) during cultivation. The precipitates were analyzed by SEM, TEM, and XAFS. When 1.0 mM Sr was dissolved in the liquid medium, the concentration of Sr decreased up to 0.02 mM within 10 days, indicating that most of Sr in the solution was eliminated within 10 days. SEM and TEM analyses showed that needle shaped precipitates containing Ca and Sr was formed. The elemental mapping showed that Sr was present at the same position of Ca, indicating that Sr was coprecipitated with Ca. The XANES analysis of Sr in the precipitates showed that the XANES spectrum resembled with that of Sr coprecipitated with an abiotic Ca carbonates and differed from that in SrCl2 and SrCO3, indicating that Sr was neither adsorbed on the Ca carbonates, nor precipitated independently as SrCO3, but was coprecipitated with CaCO3. Thus, biological coprecipitation of Sr with Ca carbonates is effective method for the elimination of radioactive Sr from saline solution.



Biography

Ohnuki T has received his PhD from Kyoto University and started research carrier at Japan Atomic Energy Research Institute. He moved to Tokyo Institute of Technology in 2016 as Professor. He has published more than 150 papers in reputed journals and has been serving as an Associate Editors-in-Chief of Journal Nuclear Science and Technology.

toshi.ohnuki@lane.iir.titech.ac.jp