Contribution ID : **59** Type : **Oral Presentation**

Digital autoradiography on C-14 labelled PMMA impregnated rock samples using the Beaver^{TM}

Thursday, 2 November 2017 11:45 (15)

In Finland and Sweden KBS-3 concept has been chosen for disposal of spent nuclear fuel in crystalline rock. Recent transport experiments have shown that heterogeneity of rock may play a major role in transport of radionuclides. Autoradiographic methods has been proven to be able to assist the characterization of heterogeneous structures. In this study we tested a novel digital autoradiographic device called Beaver^{TM} which applies a Micro Patterned Gaseous Detector in order to quantitatively map beta emissions by C-14 atoms. The studied samples were impregnated with C-14 labelled MMA (Methyl MethAcrylate) and polymerized to PMMA using heat. The Beaver^{TM} was then used to determine concentration of C-14 atoms which can then be converted to porosity based on the amount of C-14 intruded into the rock sample. The resulting images show a heterogeneous distribution of porosity which arises from the different porosities of minerals. The samples were chosen from three sites that has been used recently in *in situ* diffusion experiments: Olkiluoto (Finland), Äspö (Sweden) and Grimsel (Switzerland).

Summary

Primary author(s) : Dr VOUTILAINEN, Mikko (Department of Chemistry, University of Helsinki, Finland)

Co-author(s) : Mr SAMMALJÄRVI, Juuso (Department of Chemsistry, University of Helsinki, Finland); DONNARD, Jérôme (AI4R SAS, Nantes, France); Dr SIITARI-KAUPPI, Marja (Department of Chemistry, University of Helsinki, Finland); DUVAL, Samuel (AI4R SAS, Nantes, France)

Presenter(s) : Dr VOUTILAINEN, Mikko (Department of Chemistry, University of Helsinki, Finland)

Session Classification : Radionclide solubility, speciation, sorption & migration

Track Classification : National and international collaborative waste management programs