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## Employment

### Research Professor

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26 Jan 2024 → present

## Research outputs

### Valorisation of baryte tailings for radiation shielding in plastics and nuclear waste disposal

Kinnunen, P., Pelto, J., Viitanen, P., Olin, M. & Nieminen, M., 15 Feb 2024, In: *Heliyon*. 10, 3, e25719.

### Digitalisation for nuclear waste management: Predisposal and disposal

Kolditz, O., Jacques, D., Claret, F., Bertrand, J., Churakov, S. V., Debayle, C., Diaconu, D., Fuzik, K., Garcia, D., Graebing, N., Grambow, B., Holt, E., Idiart, A., Leira, P., Montoya, V., Niederleithinger, E., Olin, M., Pflingsten, W., Prasianakis, N. I., Rink, K., & 5 others Samper, J., Szöke, I., Szöke, R., Theodon, L. & Wendling, J., 2 Jan 2023, In: *Environmental Earth Sciences*. 82, 1, 11 p., 42.

### Repositories for Heat Producing Nuclear Waste – Behaviour of Bentonite at Higher Temperature

Olin, M., Aug 2022, In: *AMMS Aspects in Mining & Mineral Science*. 9, 4, p. 1063-1064

### Editorial for Special Issue “Clay Mineral Transformations after Bentonite/Clayrocks and Heater/Water Interactions from Lab and Large-Scale Tests”

Fernández, A. M., Kaufhold, S., Olin, M., Zheng, L. G., Wersin, P. & Wilson, J., 2022, In: *Minerals*. 12, 5, 569.

### Gasification-based thermal treatment of Low and Intermediate Level Waste containing organic matter

Nieminen, M., Laatikainen-Luntama, J. & Olin, M., 1 Apr 2020, In: *IOP Conference Series: Materials Science and Engineering*. 818, 1, 6 p., 012007.

### Geopolymerisation of gasified ion-exchange resins, mechanical properties and short-term leaching studies

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### Strategic Study of Thermal Treatment of European Radioactive Wastes

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### KYT2022 OMT – Overall Safety of Nuclear Waste Disposal

Gharbieh, H., Rasilainen, K., Ylönen, M. & Olin, M., 2020, VTT Technical Research Centre of Finland. 54 p. (VTT Research Report; No. VTT-R-00153-20).

### Comparison of microstructural features of three compacted and water-saturated swelling clays: MX-80 bentonite and Na- and Ca-purified bentonite

Matuszewicz, M. & Olin, M., 15 Mar 2019, In: *Clay Minerals*. 54, 1, p. 75-81 7 p.

### Safety case methodology for nuclear waste disposal - possible update considerations for Finnish usage

Rasilainen, K., Gharbieh, H., Olin, M. & Ylönen, M., 2019, VTT Technical Research Centre of Finland. 41 p. (VTT Technology; No. 364).

#### **Long-term experiment with compacted bentonite**

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#### **Long-term lab-scale microbial bentonite storage experiment**

Miettinen, H., Vikman, M., Matuszewicz, M., Olin, M. & Itävaara, M., 2017, p. 73.

#### **Effect of layer charge on the crystalline swelling of Na<sup>+</sup>, K<sup>+</sup> and Ca<sup>2+</sup> montmorillonites: DFT and molecular dynamics studies**

Seppälä, A., Puhakka, E. & Olin, M., 2016, In: Clay Minerals. 51, 2, p. 197-211

#### **Influence of sample preparation on MX-80 bentonite microstructure**

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#### **Microstructural features of compacted MX-80 bentonite after the long-time experiment**

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#### **Recent research and technology highlights for Finnish implementation of geological disposal of radioactive waste**

Holt, E., Olin, M. & Jalonen, T., 2016, In: ATS Ydintekniikka. 45, 1, p. 32-35

#### **Bentoniitin ominaisuuksien arviointi käytetyn ydinpolttoaineen loppusijoitusta varten**

Olin, M., 2015, In: ATS Ydintekniikka. 44, 4, p. 28-31

#### **Modeling transport of water, ions, and chemical reactions in compacted bentonite: comparison among toughreact, numerrin, and comsol multiphysics**

Itälä, A., Laitinen, M., Tanhua-Tyrkkö, M. & Olin, M., 2015, In: Nuclear Technology. 187, 2, p. 169-174

#### **X-ray studies on the nano- and microscale anisotropy in compacted clays: Comparison of bentonite and purified calcium montmorillonite**

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Ari-Lahti, E., Lehtikuusi, T., Olin, M., Saario, T. & Varis, P., 2013, In: Corrosion Engineering Science and Technology. 46, 3, p. 134-137

#### **Käytetyn polttoaineen huolto: Turvallisuusperustelu tutkimuksen ja päätöksenteon välineenä**

Rasilainen, K., Vuori, S., Olin, M., Ahonen, L. & Suksi, J., 2013, Espoo: VTT Technical Research Centre of Finland. 62 p. (VTT Technology; No. 92).

#### **Microstructural investigation of calcium montmorillonite**

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#### **Innovative techniques for decommissioning and minimisation (optimization) of the decommissioning radioactive waste**

Olin, M., 2012.

#### **Bentoniittipuskurin kytketty käyttäytyminen: PUSKURI-hankkeen tuloksia**

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**Chemical evolution of bentonite buffer in a final repository of spent nuclear fuel during the thermal phase**

Itälä, A. & Olin, M., 2011, In: Nuclear Technology. 174, 3, p. 342-352 11 p.

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**Anyone can simulate? The Q9 operations model to guide execution of simulation projects**

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Olin, M., Itälä, A., Rasilainen, K., Liukkonen, M. & Lehtikoinen, J., 2010, *Book of abstracts: Clays in natural and engineered barriers for radioactive waste confinement - 4. International meeting*. p. 521-522 P/AP/PTO/15. (INIS Report; No. INIS-FR-15-CLAYS-NANTES-2010, Vol. 46).

**COMSOL multiphysics, TOUGHREACT and Numerrin comparison in some modelling task of spent nuclear fuel disposal**

Itälä, A., Laitinen, M., Tanhua-Tyrkkö, M., Pulkkanen, V-M. & Olin, M., 2010, *COMSOL Conference 2010 Paris: User presentations and proceedings*. COMSOL, 6 p.

**Erosion of buffer caused by groundwater leakages based on EMS-application**

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**Modeling the Interaction Between Compacted Bentonite Clay and Hyperalkaline Solution**

Tanhua-Tyrkkö, M., Olin, M. & Lehtikoinen, J., 2009, *Proceedings of the TOUGH Symposium 2009: September 14—16, 2009*. Berkeley, p. 277-282

**SISU - Simuloinnin ja suunnittelun uudet sovellustavat ja liiketoiminta. Hyödyn elementit ja käyttöönoton prosessit: SISUQ8**

Leppävuori, J., Olin, M., Valli, A., Lahti, S., Hasari, H., Koistinen, A. & Leppänen, S., 2009, Metropolia University of Applied Sciences. 66 p. (Metropolia Ammattikorkeakoulun julkaisuja: Sarja D; No. Työpaperit 1).

### **Sorption of biotite**

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### **Using COMSOL for the Transport Modelling of Some Special Cases in a Bentonite Buffer in a Final Repository for Spent Nuclear Fuel**

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### **LÄHITHC: Bentoniitin THC-mallinnusta termisessä vaiheessa**

Itälä, A-K. & Olin, M., 2008. 17 p.

### **New Methods to Model and Simulate Both Air Exchange and Particle Contamination of Portable Devices**

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### **Transport and chemical reactions in nuclear waste studies**

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### **Characterisation of Kaolinite and Adsorption of Europium on Kaolinite**

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### **Suunniteltu Suomessa vai Intiassa! Auttaako SISU?**

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### **The model structure of kaolinite in relation to surface complexation**

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### **Comparative Evaluation of Surface Complexation Models for Radionuclide Sorption by Diverse Geologic Materials**

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### **Experimental and theoretical studies on air exchange of portable devices**

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### **Mineral-specific sorption of Cs, Ni, Eu and Am on granodiorite and mica gneiss**

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#### **Modelling the transport in the porous layer of oxide films formed on material surfaces in nuclear power plants: A BWR case study**

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