



**of the European Atomic Energy Community (Euratom)  
for nuclear research and training activities (2007-2011)**

### **Collaborative Project**

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| <i><b>ReCosy</b></i> |
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Project title: **REDOX PHENOMENA CONTROLLING  
SYSTEMS**

Project number: **212287**

Project coordinator: **Forschungszentrum Karlsruhe, Germany**

Project homepage: <http://www.recosy.eu/>

FZD participant: **Institute of Radiochemistry**

Starting date: **01.04.2008**

Duration (months): **48**

### **Summary**

Main objectives of ReCosy are the sound understanding of redox phenomena controlling the long-term release/retention of radionuclides in nuclear waste disposal and providing tools to apply the results to Performance Assessment/Safety Case.

Although redox is not a new geochemical problem, different questions are still not resolved and thus raised by implementers and scientists. From a top-down approach, the reliability of redox measurements for site characterization, redox disturbances by the near-field materials, changes induced by glaciation scenarios or the redox buffer capacity of host-rocks and the kinetics of response to redox perturbations are addressed.

From a bottom-up approach, questions concerning the interpretation of mixed potentials, surface mediated reactions, redox states of actinides and long-lived fission products, the source term of

spent nuclear fuel in the presence of corroding steel as well as the role of microbes and biofilms on the evolution of the redox state are tackled.

Radionuclide redox transformations on minerals are decisive scenarios in the NEA FEP list and in the RETROCK project. In the large FP6 Integrated Projects NF-PRO and FUNMIG, redox phenomena controlling the retention of radionuclides were addressed, although not systematically considered.

The ReCosy concept is innovative in the scientific approach to the redox phenomena, including i) advanced analytical tools, ii) investigation of processes responsible for redox control, iii) required data on redox controlling processes, and iv) response to disturbances in disposal systems.

To this aim, the scientific-technical work program is structured along six RTD workpackages, covering near-field and far-field aspects as well as all relevant host-rocks considered in Europe. The 28 partners of ReCosy include the key European Research Institutes and Universities from 12 European countries, and Russia.