

Science in Radioactive Waste Management.

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Radioactive waste management is a societal mission in most countries. As it is the first time in history that it is suggested to use deep geological formations for protecting thousands of future generations from the hazardous waste, much research is necessary. Research in radioactive waste management is ongoing since about 50 years. In the meantime, not a single disposal site for high radioactive waste has been licensed worldwide, even though; one is coming closer, awaiting the first repository openings in the next decade. So, much more research will be necessary in the future.

Research needs cover chemistry (incl. radiochemistry), nuclear physics, mathematics and computer science, earth and engineering sciences, life sciences etc. for studying and modelling the interactions and temporal evolutions of nuclear waste matrices, containers, overpacks, backfills and seals, as well as the behaviors of repository rocks and overburdens, the hydrological settings and transport properties like diffusion of fluids and radionuclides from the emplaced waste to the human environment.

The ongoing European EURAD Joint program of 103 partners from a large part of the member states of the European Union is going to establish a research road map and strategic research agenda, bridging the various phases and themes of a generic nuclear waste disposal program in granite or clay, from the waste to the engineered barrier system and the geosphere to safety analyses.

Some research examples will be given in my presentation in the areas of spent fuel and nuclear waste glass behavior, container corrosion, radionuclide solubility, radionuclide migration or gas migration in clay rock.