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## Trapping efficiency of an encapsulation mortar incorporating a tritium getter for radioactive waste conditioning

This research is performed in the framework of the MACH3 project, which is funded by the French PIA (Future Investment Plan). MACH3 contributes to the management of radioactive waste containing liquid and gaseous tritium. The reference conditioning process for these waste is cementation, i.e. the immobilisation of the waste using a hydraulic binder. The acceptance of tritiated waste on storage sites depends on a low release level of gaseous tritium (tritium in its liquid form being less mobile). Currently, the two main options are to incorporate low levels of waste in the storage packages, or to perform a costly preliminary de-tritiation process. In order to improve this situation, the MACH3 project has developed cement matrices for the encapsulation of tritiated waste, and able to limit tritium degassing by an irreversible trapping of its gaseous forms. Our method has consisted in developing cement mortars incorporating a tritium getter (based on  $\text{Ag}_2\text{O}/\text{MnO}_2$ ) in a powdered or aggregate form. The developed mortars allow both gas transport and tritium gas trapping (controlled gas flow). They have adequate workability and a minimal mechanical performance of 20 MPa after 7 days endogenous curing. To this purpose, the mortar granular skeleton has been slightly destabilized to increase the pore pathways accessible to gas. Thanks to in situ gamma irradiation tests, the formulated mortars display an excellent trapping ability.

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### Do you wish to participate as a Young Professional?

No

### Do you wish to be considered for a Young Professional grant?

No

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