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Assessment of Moroccan natural additions impact on the cementation process quality of the spent and radioactive ion exchange resins: strength and ^{134}Cs leaching resistance and morphological structure.

The present work is undertaken within the general framework of radioactive waste management. It concerns the optimization of used and radioactive ion exchange resins cementation. The study aims to develop the quality of IER cemented form. It also propose to increase the IER loading. Referred to the formulation with 8.3% of IER adopted at the nuclear study center of Maamoura (CENM), Morocco. The investigation of the impact of the addition of local and natural materials in cementitious IER formulation has been realized. They are local red clay (MA), limestone and marly limestone. Cemented forms prepared with 8.3% and 12% of IER loads were compared to those of 12% of IER loading prepared with 4% of additions and (4% - 12%) of MA. Mechanical strength, porosity, ^{134}Cs leaching, morphological structure development were assessed. The cementitious process conformity was studied using the diffusion coefficient and leaching index. The obtained results show that MA has improved the quality of IER cemented forms. Compared to the CENM formulation, the formulation with 12% of IER and 10% of MA allows improving the mechanical strength and the porosity by 137% and 14%, respectively. It leads decreasing conditioning cost and the final waste volume by 30%.

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