

## Sintered Phosphate Cement for HLW Encapsulation

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**Abstract :** The presence of volatile radionuclides in high level waste (HLW) in the nuclear industry limits the use of high temperature encapsulation technologies (glass and ceramic). Chemically bonded phosphate cement (CBPC) matrixes can be used for encapsulation of low level waste. This waste form is however not suitable for high level waste due to the radiolysis of water in these matrixes. In this research, the sintering behavior of the magnesium potassium phosphate cement waste forms was investigated. The addition of sintering aids resulted in the sintering of these phosphate cement matrixes into dense monoliths containing no water. Experimental evidence will be presented that this waste form can now be considered as a waste form for volatile radionuclides and high level waste as radiation studies indicated no chemical phase transition or physical degradation of this waste form.

**Keywords :** chemically bonded phosphate cements, HLW encapsulation, thermal stability, radiation stability

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