SiAlON glasses as a potential matrix candidate for the transmutation of radioactive wastes

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In radioactive waste management, an alternative to the disposal in deep geological site is transmutation. The dispersion of these wastes in a nuclearly inert matrix, followed by a change in their chemical nature by nuclear reaction in a reactor would lead to their quantitatively significant destruction. Most ceramic materials become amorphous under severe irradiation conditions. It follows that their structural and functional properties evolve dramatically. The possibility of using inert amorphous target was therefore investigated. Rare earth nitrogen alumino-silicate glasses meet all the requirements for being used as target matrices for the transmutation of actinides. Several glass compositions were studied and their mechanical properties were characterized both prior to and after heavy-ions bombardment at GANIL (Caen, France).