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Current advances on titanate-based glass-ceramics for actinide immobilization

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Glass-ceramics have attracted recent attention as they have the advantage of combining the chemical flexibility of glasses with the excellent durability of ceramics, making them potential waste forms for the immobilization of actinide wastes with processing chemicals. Glass-ceramics based on titanate ceramic phases, e.g. zirconolite, pyrochlore and brannerite have been developed at ANSTO. The formations of these titanate dominated glass-ceramics have been demonstrated with uranium as proof of concept and plutonium with gadolinium and/or hafnium as neutron absorbers. This talk will focus on the current advances in the field including the formation and crystallization of titanate phases in glass, structure and microstructure characterization, actinide incorporation and actinide valences.

Summary

Primary author(s) : Dr ZHANG, Yingjie (ANSTO)

Co-author(s) : Dr GREGG, Daniel (ANSTO); Dr KARATCHEVTSEVA, Inna (ANSTO); Dr KONG, Linggen (Australian Nuclear Science and Technology Organisation); Mr AUGHTERSON, Rob (ANSTO)

Presenter(s) : Dr ZHANG, Yingjie (ANSTO)

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