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New insight in corrosion mechanisms of nuclear fuel cladding using synchrotron x-rays

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In water-cooled nuclear reactors zirconium alloys have been the material of choice to encapsulate the fuel due to a combination of low neutron cross-section, excellent corrosion performance and good mechanical properties. However, fuel cladding performance, or our ability to predict its performance, remains the limiting factor in an effort to push for increased fuel burnup, i.e. the energy extracted from a fuel assembly before it is removed from the core.

Aqueous corrosion, and the associated hydrogen pick up, remains one of the limiting factors to take nuclear fuel assemblies to higher fuel burnup. Even slight variation in alloy chemistry is known to greatly affect the corrosion performance of a Zr-alloy. Michael will discuss the application of synchrotron x-ray diffraction and scattering techniques together with other advanced characterisation techniques to provide new understanding of the integrity and therefore passivation capability of the oxide that forms during aqueous corrosion.

Presenter Gender

Man

Do you wish to take part in the Student Poster Slam

Condition of submission

Yes

Students Only - Are you interested in AINSE student funding

Level of Expertise

Expert

Pronouns

Which facility did you use for your research

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