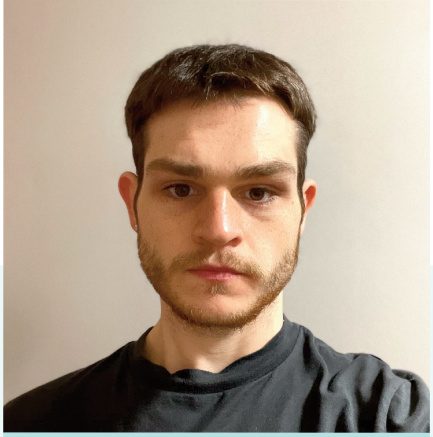
POSTER EXPOSITION

The University of Manchester

Poster 1

Initial microstructure characterisation of some castable nanostructured alloys for fission and fusion applications



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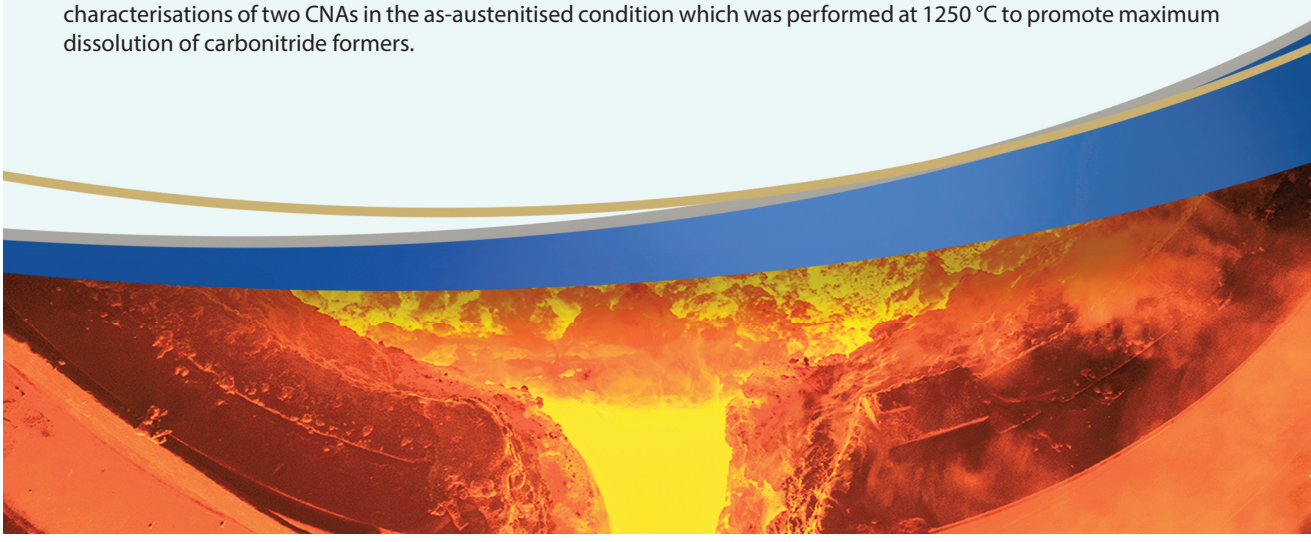
ABSTRACT:
Castable nanostructured alloys (CNAs) are a new class of ferritic/martensitic (FM) F-9Cr steels offering high creep resistance for high temperature applications such as structural components in nuclear power stations.

This makes CNAs desirable for Gen III+ fission and DEMO-class fusion reactors, as well as non-nuclear plants. They feature an increased volume fraction of thermally stable MX-type nanoprecipitates compared to traditional FM grades such as commercial P91, enabling mechanical properties to rival recent ODS grades while retaining ductility, fracture toughness and scalable manufacture.

Their development could lead to superior radiation tolerance over existing grades as demanded by advanced nuclear systems, as well as increased operating temperatures up to 650 °C. This poster presents some initial microstructural characterisations of two CNAs in the as-austenitised condition which was performed at 1250 °C to promote maximum dissolution of carbonitride formers.



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