



Contribution ID : 14

Type : Poster

Diffuse Scattering Studies from a Martensitic Fe-Pd Alloy

Thursday, 25 November 2021 17:48 (1)

From literature reports, Fe-Pd alloys in the vicinity of Fe-30at%Pd exhibit two martensitic transformations on being cooled from just above room temperature to about 100 K. A preliminary study of a large single crystal of this composition at the KOALA beamline, not only showed evidence for these transformations but also revealed most interesting satellite reflections around certain Bragg spots. The crystal was then studied further in two triple-axis experiments. The first was at TAIPAN, specifically to study elastic scattering and the second, at SIKA, to study quasi-elastic scattering both in the vicinity of certain Bragg peaks but also around the satellite reflections observed at KOALA. During a parallel experiment to the SIKA one, an ideally small piece of the crystal was studied at KOALA but the interesting satellites found for the large crystal were not present. As a result, in a further experiment on the large crystal at KOALA, completed in early 2021, diffraction patterns were collected with the aim of surveying the whole of the large crystal, particularly in the vicinity of the edge from which the ideally small crystal piece had been extracted by electro-discharge machining. The results from this last experiment will be summarised and discussed in relation to the earlier triple-axis and KOALA results.

Level of Expertise

Experienced Researcher

Presenter Gender

Man

Pronouns

Which facility did you use for your research

Australian Centre for Neutron Scattering

Students Only - Are you interested in AINSE student funding

No

Do you wish to take part in the Student Poster Slam

No

Condition of submission

Yes

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Session Classification : Poster Session

Track Classification : Instruments & Techniques