Contribution ID: **22** Type: **Oral talk**

The Mutual Influence of Production Rate of Point Defects and Temperature on the Effects of Radiation-Induced Segregation in the Fe-20Cr-8Ni Alloy

Wednesday, 17 January 2024 11:05 (20 minutes)

In this paper, a computer simulation of radiation-induced segregation in the Fe-20Cr-8Ni alloy was carried out within the framework of the modified inverse Kirkendall model [1-3]. The dependences of the concentrations of Cr and Ni atoms on the surface of the sample on the rate of production of point defects and temperature, as well as the concentration profiles of Cr and Ni atoms and point defects, were calculated. The influence of the rate of production of point defects and temperature on the concentration profiles of components and point defects is analyzed in detail. It is shown that the effect of the increase in the rate of production of point defects on the concentration profiles of the alloy components can be compensated with a sufficiently high accuracy by a relatively small increase in temperature (fig. 1). This effect is explained by the competition of two mechanisms: (i) increasing the irradiation of the alloy leads to a narrowing of the concentration profiles; (ii) an increase in temperature leads to a broadening of concentration profiles.
<img src="https://indico.bitp.kiev.ua/event/11/contributions/274/attachments/113/209/FigureFig. 1. Concentration profiles of Cr and Ni in the Fe-20Cr-8Ni alloy under irradiation.

1. G.S. Was, *Fundamentals of Radiation Materials Science. Metals and Alloys* (2nd ed.) (New York: Springer: 2017).
2. R.V. Skorokhod, O.M. Buhay, V.M. Bilyk, V.L. Denysenko and O.V. Koropov, *East European Journal of Physics*, **5**, No. 1: 61–69 (2018) (in Ukrainian).
3. R.V. Skorokhod and O.V. Koropov, *Metallofiz. Noveishie Tekhnol.*, **44**, No. 6: 691—711 (2022) (in Ukrainian).

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Session Classification: Morning Session 2

Track Classification: Condensed Matter Physics