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**Effect of 2 MeV Fe<sup>3+</sup> irradiation on Fe atom population in a  $\sigma$ -phase Fe-Cr***Stanisław M. Dubiel<sup>1\*</sup> and Jan Żukrowski<sup>1,2</sup>*

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$\sigma$ -Fe<sub>54.5</sub>Cr<sub>45.5</sub> samples irradiated in vacuum with 2 MeV Fe<sup>3+</sup> ions at 300, 400, 475 and 700°C to the maximum dose of 12.5 dpa were studied with the conversion electron Mössbauer spectroscopy (CEMS). The analysis of the room temperature CEMS spectra revealed an irradiation-induced redistribution of Fe atoms viz. their number on B and D sites decreased while on A, C and E sites increased. The degree of the redistribution was found to be proportional to the number of Fe atoms present on the lattice sites in the non-irradiated samples. The highest degree of the redistribution was revealed in the sample irradiated at 300°C. No change in the site occupancy was found in the sample irradiated at 700°C.

Key words: Intermetallic alloys and compounds; Radiation damage; Mossbauer; Sigma phase

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