

## Influence of Impurities in Microstructural Evolution of FeCr Alloys Under Ion Irradiation – Link with Hardening

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After neutron irradiation of Fe-Cr alloys of low purity (model alloys of F-M steels), impurities as P, Ni and Si have been shown to create solute clusters which significantly contribute to hardening and might be associated with small dislocation loops. In order to understand the role of each impurity on the formation of the nano-features formed under irradiation and the eventual synergies between the different species, FeCr(SiNiP) alloys of different composition have been ion irradiated and characterized using transmission electron microscopy, atom probe tomography and nano-indentation. Combination of these techniques enabled to study the influence of these impurities on the formation of solute clusters and dislocation loops and to make the link with irradiation hardening. Influence of C atoms on the nanostructure evolution will also be discussed.