Dispersoid stability in a Cu-Al2O3 alloy under energetic cascade damage conditions - DTU Orbit (11/12/2018)

Dispersoid stability in a Cu-Al2O3 alloy under energetic cascade damage conditions
A commercial dispersion-strengthened Cu-Al2O3 alloy was irradiated with 750-MeV protons at 470 K to a damage level of about 2 displacements per atom (dpa). The density and size distribution of the Al2O3 particles was measured in nonirradiated and irradiated specimens using transmission electron microscopy. The mean primary knock-on atom (PKA) energy for 750-MeV protons in copper is 2.5 MeV, which is about 10 and 100 times higher than the average PKA energies in copper for fusion and fission neutrons, respectively. The irradiation caused only a slight decrease in the mean Al2O3 size, from 10.5 nm to 8.3 nm, and a slight decrease in the particle density from 4 X 10(22)/m3 to 3 x 10(22)/m3.

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