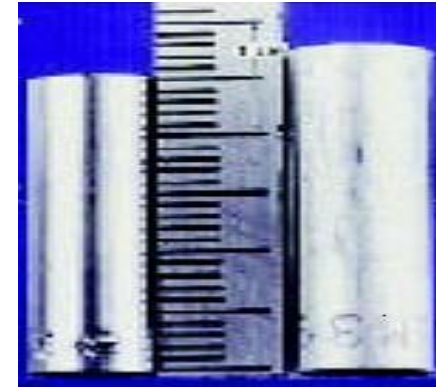
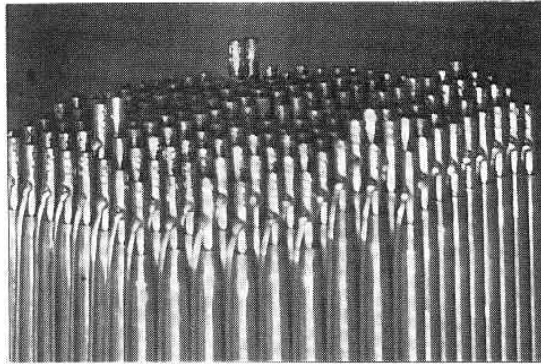
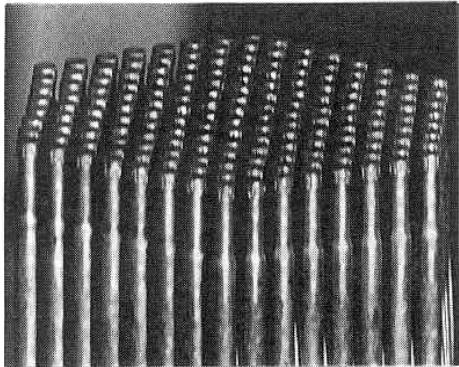


Application of Ion Accelerators in Study of Defects

Fast Reactors : Structural components – Steels : High temperature and corrosion resistance

Exposure to high temperature and neutron flux : dimensional changes

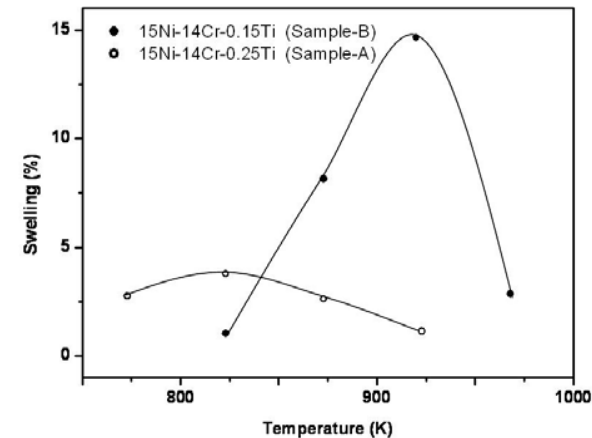


Courtesy: *Materials Science and Technology: A Comprehensive Treatment, Vol. 10A, Nuclear Materials, Pt. I*

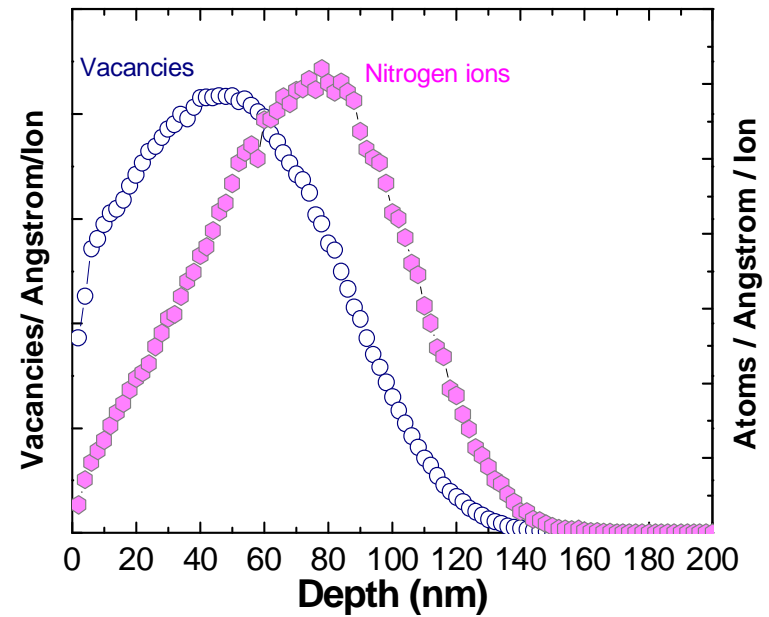
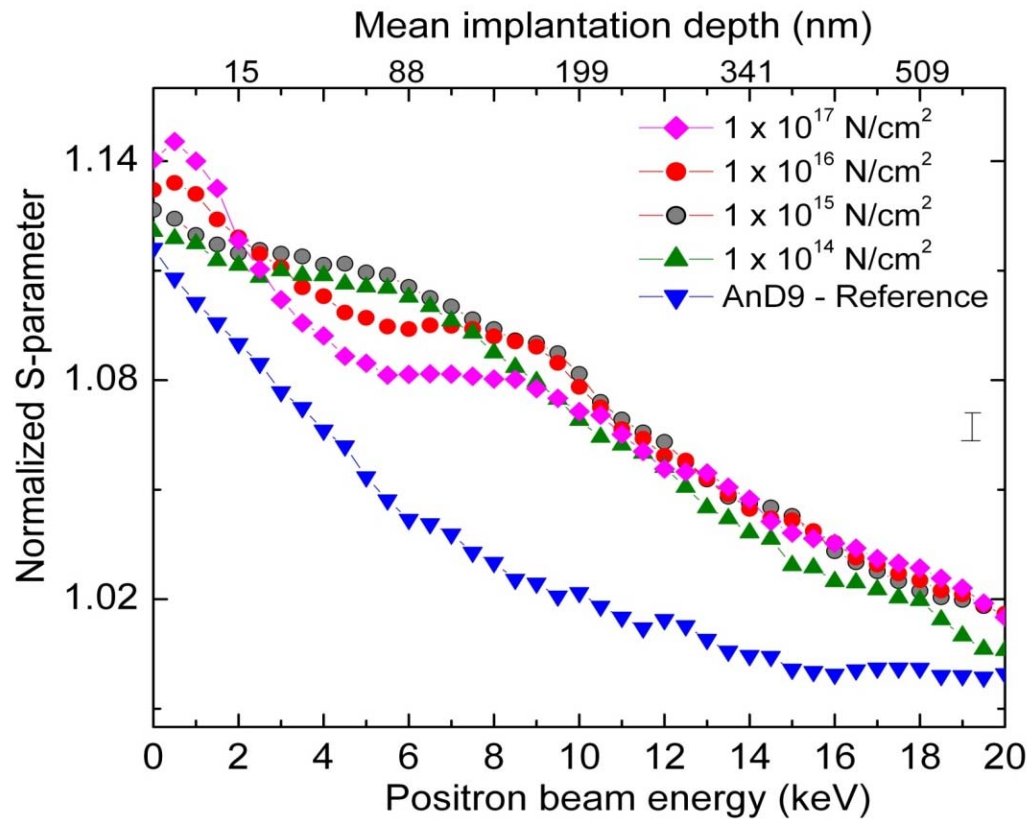
Residence time : decrease due to void swelling, creep

Damage creation: 5 MeV Ni ions + 30 appm Helium

20% CW D9 alloy samples -
Sample A: (15Ni-14Cr) - **0.25Ti** Sample B (15Ni-14Cr) - **0.15Ti**



Temperature dependence of void swelling measured by surface profilometry for the D9 alloys with different titanium concentration



The observed decrease in S-parameter for the fluence of 1×10^{16} ions/cm² and 1×10^{17} ions/cm² could be due to the change in the local environment around the vacancies, probably nitrogen decoration of vacancy defects

SRIM Code simulation shows that the implantation profile of nitrogen starts from the surface and extends up to a depth of 140 nm with peak at 72 nm and similarly the vacancy profile stretches until 120 nm with peak damage at 45 nm

Thank You

For

Your Kind Attention