

Some Studies on Irradiation Creep of Graphite

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Studies of the irradiation induced creep of graphite in the reactor BR-2 have been described previously for a large number of specimens under constant compressive stress and a few tensile specimens. Further creep data have been obtained on specimens under constant tensile loads, and include those from specimens irradiated over a wider range of temperatures. Thermal annealing experiments of both tensile and compressive creep strain up to temperatures greater than 2000°C have also been carried out.

It is shown that over a fast neutron dose range of $50 \times 10^{20} \text{ n.cm}^{-2}$,

- (i) near isotropic graphites from different sources have substantially the same creep behaviour.
- (ii) there is no difference in creep strain between specimens irradiated at 650°C and specimens irradiated at 400°C.
- (iii) there is no significant difference between tensile and compressive creep behaviour over the dose range examined.

Specimens containing compressive and tensile creep strain do, however, show a different behaviour on thermal annealing. There is a large apparent recovery of compressive creep strain on annealing at temperatures greater than 2000°C, but a comparatively small recovery of tensile creep strain. These results are discussed in terms of current ideas on dimensional changes in graphite.