ON THE STRENGTH OF REACTOR GRAPHITE AND RELATED DESIGN PROBLEMS

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A general inability to design with brittle materials affects the assessment of specific graphite component design for high-temperature gas-cooled reactors.

In order to improve on the current methods of stress analysis and to adopt correct resistance criteria, a better knowledge of the material and of testing methods is required. The paper dwells on the statistics of unaxial tensile behaviour as dependent on volume, texture and material constituents. Neutron irradiation behaviour at high dosis and temperatures including in-pile creep behaviour is considered.

Statistical considerations apply as a mean for an improved characterization of a material as well as a base to a statistical resistance criterion. Both aspects are treated and discussed.