

NEUTRON IRRADIATIONS OF PYROGRAPHITES AND POLYCRYSTALLINE
ARTIFICIAL GRAPHITES AT LIQUID NITROGEN TEMPERATURE. STORED
ENERGY AND DIMENSIONAL CHANGES.

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Stored energy measurements have been made on graphite and pyrographite samples by means of a special differential self-compensated-power adiabatic calorimeter after neutron irradiations at liquid nitrogen temperature in "Siloé" reactor at the Grenoble Nuclear Research Center.

The samples studied were : polycrystalline artificial graphite of nuclear grade, as deposited pyrographite, and high temperature stress recrystallized pyrographite. It has been possible to give an accurate definition of the diagram of energy released during controlled annealings between 80 and 670°K, and particularly to specify the rather complicated shape of the "classical" Wigner stage near 200°C. For as-deposited pyrographite, the profile is quite different, in this region, from that of the other samples studied.

From measurement of the total energy released between 80 and about 670°K, it is possible to evaluate energy formation of a vacancy-interstitial pair, and the value is in good agreement with theoretical evaluations.

On the other hand, at this low temperature of irradiation, no sensible effect has been observed with a neutron flux variation ranging 1 to 20 ; this confirms the validity of existing theoretical considerations on the primary annealing processes in irradiated graphites. Finally, comments are given on results of dimensional changes and their annealing from 80°K for some low temperature irradiated samples.

(about 15 minutes).