

Thermal Conductivity of Polycrystalline Graphite

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Summary

Measurements of thermal conductivity from 100–900°K and electrical resistivity at 90°K have been made on two mutually perpendicular directions of two types of anisotropic polycrystalline graphites and of two isotropic graphites of different densities. The thermal conductivity curves can be fitted using expressions calculated for thermal resistance due to boundary and isotope scattering and a relationship for Umklapp scattering derived from pyrolytic graphite. By invoking a factor to account for the reduction in conductivity due to porosity and irregular arrangement of crystallites in polycrystalline graphite, crystallite sizes obtained from thermal conductivity analysis agree with crystallite sizes obtained from electrical resistivity measurements using the simple two band model.

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