

Crystallography of graphite spheroids in cast iron

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To further understand graphite growth mechanisms in cast irons, this study focuses on the crystal structure of a graphite spheroid in the vicinity of its nucleus. A sample of a graphite spheroid from a commercial cast iron was characterized using transmission electron microscopy. The chemical composition of the nucleating particle was studied at the local scale. Crystal orientation maps of the graphite spheroid revealed misorientations and twist boundaries. High resolution lattice fringe images showed that the basal planes of graphite were wavy and distorted close to the nucleus and very straight further away from it. These techniques were complementary and provided new insights on spheroidal graphite nucleation and growth.

Keywords: graphite growth, heterogeneous nucleation, crystal orientation, transmission electron microscopy