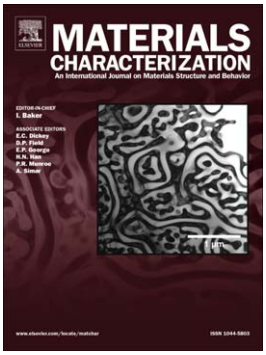

A transmission Kikuchi diffraction study of cementite in a quenched and tempered steel

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A transmission Kikuchi diffraction study of cementite in a quenched and tempered steel

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Abstract

This is the first transmission Kikuchi diffraction (TKD) study to report the indexing of nano-sized cementite as distinct structures and its orientation relationship with the bcc matrix in a quenched and tempered steel. Crystallographic analysis via TKD and selected area diffraction returned the well-known Bagaryatskii and Isaichev orientation relationships. However, the indexing of nano-sized cementite via TKD was sensitive to the thickness of the electron transparent region such that TEM remains the most precise method to characterise such precipitates.

Keywords: cementite; electron back-scattering diffraction (EBSD); transmission Kikuchi diffraction (TKD); orientation relationship

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