

Raman spectroscopy: Alternate method for strain and carbon substitution study in MgB₂.

Abstract

In the present work, Raman spectroscopy is employed to study the strain and carbon substitution effect of SiC doped polycrystalline MgB₂. We demonstrated that Raman spectroscopy analysis is more accurate to estimate the carbon substitution compared to the X-ray diffraction analysis. Raman result showed that lattice shrinkage cannot account alone for carbon incorporation where high level of lattice distortion is attributing to both C substitution and lattice strain effect. Our result provides alternative explanation for lattice variation in the non-carbon doped MgB₂ which is basically due to lattice strain.

Keyword: MgB₂; Carbon doping; Non-uniform strain; Raman spectroscopy.