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Abstract

X-ray scattering study of the average polycyclic aromatic unit in Ledo coal

- Rajani K.Boruah ,
- Binoy K.Saikia ,
- Bimala P.Baruah and
- Nibaran C.Dey

Rajani K. Boruah, e-mail: rajani_boruah@yahoo.co.in

Abstract

This report is an attempt to understand the short-range structural features, to determine the relationship(s) between the aryl/alkyl carbon ratio, and to determine the size of the average polycyclic aromatic unit in Ledo coal from Makum coalfield, Assam, India. An X-ray scattering analysis of the average polycyclic aromatic unit in the coal indicates that the aromatic fraction in this coal is 74% with the aliphatic fraction correspondingly estimated to be 26%. The average carbon atom has 2.3 nearest carbon atom neighbours at an average bond distance of 1.50 (1) Å. The average stacking height of the parallel aromatic layers and the average diameter of the aromatic layers are estimated to be 7.58 Å and 4.86 Å, respectively. For this coal, the average number of stacking layers and the average number of atoms per layer are estimated to be 2 and 8, respectively. In addition, the Gamma band is observed at a d value of 4.42 Å.