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Volume 30, Issue 4, August 2007, Pages 421-426

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XRD and FT-IR investigations of sub-bituminous Assam coals[Saikia, B.K.](#)^a  , [Boruah, R.K.](#)^b , [Gogoi, P.K.](#)^c  ^a Department of Chemical Sciences, Tezpur University, Tezpur 784 028, India^b Analytical Chemistry Division, **Regional Research Laboratory, Jorhat** 785 006, India^c Department of Chemistry, Dibrugarh University, Dibrugarh 786 004, India**Abstract**

Two coal samples collected from Makum coal field, Assam, India were studied by XRD and FT-IR techniques. The X-ray diffractogram shows the existence of some crystalline carbons in Assam coals as proven by the appearance of peaks. The radial distribution functional (RDF) method was applied for the determination of structural aspects of the coals. The study indicates that the coals are lignite in type and there is no evidence of graphite-like structures. The maximum in the G(r) plots of function of radial distribution of atoms (FRDA) relates to different distances between carbon atoms of aliphatic chains. The first significant maximum relates to the C-C bond (type C-CH=CH-C), the second maximum relates to the distance between carbon atoms of aliphatic chains that are located across one carbon atom. The curve intensity profiles obtained from FRDA show quite regular molecular packets for this coal. The coals were found to be lignite in nature. FT-IR study shows the presence of aliphatic carbon, C=O and C-O stretching associated with -OH and -NH stretching vibrations. Kaolinite and quartz were also found to be major minerals in Assam coals by FTIR spectroscopy. The difference in intensities of carbonyl groups of the coal samples is likely to relate with the rank. © Indian Academy of Sciences.

Author Keywords

Assam coal; Coal structure; RDF of coal

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