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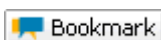
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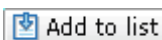
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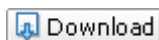
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## XRD and FT-IR investigations of sub-bituminous Assam coals

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### 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.

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**Author Keywords**

Assam coal; Coal structure; RDF of coal

**References (41)** [view in table layout](#)
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1.  Alvarez, A.G., Molina-Sabio, M., Rodríguez-Reinoso, F.  
**An X-ray scattering investigation of the carbonization of olive stones**  
 (1998) *Carbon*, 36 (1-2), pp. 67-70. [Cited 7 times](#).  
[Abstract + Refs](#) [View at Publisher](#)
2.  Barooah, P.K., Baruah, M.K.  
 (1996) *Fuel Process. Technol*, 46, p. 85.  
 references therein
3.  Baruah, B.P., Saikia, B.K., Kotoky, P., Gangadhar Rao, P.  
**Aqueous leaching on high sulfur sub-bituminous coals, in Assam, India**  
 (2006) *Energy and Fuels*, 20 (4), pp. 1550-1555. [Cited 3 times](#).  
 doi: 10.1021/ef049701y  
[Abstract + Refs](#) [View at Publisher](#)
4.  Blayden, H.E., Gibson, J., Riley, H.L.  
 (1944) *Proc. conf on ultrafine structure of coals and cokes*, p. 176. [Cited 7 times](#).  
 London: BCURA p
5.  Cartz, L., Hirsch, P.B.  
 (1960) *Proc. R. Soc. (London)*, A252, p. 557.  
[View at Publisher](#)
6.  Cartz, L., Diamond, R., Hirsch, P.B.  
**New x-ray data on coals**  
 (1956) *Nature*, 177 (4507), pp. 500-502. [Cited 19 times](#).  
 doi: 10.1038/177500a0  
[Abstract + Refs](#) [View at Publisher](#)
7.  Cooke, N.E., Fuller, M., Gaikwad, R.P.  
 (1986) *Fuel*, 65, p. 1254. [Cited 20 times](#).  
[View at Publisher](#)
8.  Das, T.K.  
**Evolution characteristics of gases during pyrolysis of maceral concentrates of Russian coking coals**  
 (2001) *Fuel*, 80 (4), pp. 489-500. [Cited 7 times](#).  
 doi: 10.1016/S0016-2361(00)00126-5  
[Abstract + Refs](#) [View at Publisher](#)
9.  Diamond, R.  
 (1958) *Acta Crystallogr*, 11, p. 129. [Cited 22 times](#).  
[View at Publisher](#)
10.  (1981) *Chemistry of coal, utilization, second supplementary volume*, p. 89.  
 Elliot Martin A (ed, New York: John Wiley & Sons) p

11.  Given, P.H., Davis, A., Kuehn, D., Painter, P.C., Spackman, W.  
**A multi-faceted study of a Cretaceous coal with algal affinities. I. Provenance of the coal samples and basic compositional data.**  
(1985) *International Journal of Coal Geology*, 5 (3), pp. 247-260. [Cited 8 times](#).  
[Abstract + Refs](#) [View at Publisher](#)
12.  Gorbaty, M.L., Ouchi, K.  
(1981) *Coal structure*, pp. 1-2.  
Washington, DC: American Chemical Society pp
13.  Grigoriew, H.  
**Diffraction studies of coal structure**  
(1990) *Fuel*, 69 (7), pp. 840-845. [Cited 8 times](#).  
doi: 10.1016/0016-2361(90)90228-I  
[Abstract + Refs](#) [View at Publisher](#)
14.  Haenel, M.W.  
(1992) *Fuel*, 71, p. 1211. [Cited 52 times](#).  
[View at Publisher](#)
15.  (1954) *Fuel testing, laboratory methods in fuel technology*, pp. 67-78. [Cited 3 times](#).  
Himus G W (ed, London: Leonard Hill) pp
16.  Hirsch, P.B.  
(1954) *Proc. R. Soc. (London)*, A226, p. 143. [Cited 61 times](#).  
[View at Publisher](#)
17.  Iino, M.  
**Higher order structures of coal and their influence on coal reactivity**  
(2002) *Energy and Fuels*, 16 (1), pp. 1-2. [Cited 4 times](#).  
doi: 10.1021/ef0101614  
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