

A geochemical study of macerals from a Miocene lignite and an Eocene bituminous coal, Indonesia

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Abstract—Optical and chemical studies of maceral concentrates from a Miocene lignite and an Eocene high-volatile bituminous C coal from southeastern Kalimantan, Indonesia were undertaken using pyrolysis, optical, electron microprobe and FTIR techniques. Pyrolysis products of vitrinite from bituminous coal were dominated by straight-chain aliphatics and phenols. The huminite of the Miocene lignite produced mostly phenolic compounds upon pyrolysis. Differences in the pyrolysis products between the huminite and vitrinite samples reflect both maturation-related and paleobotanical differences. An undefined aliphatic source and/or bacterial biomass were the likely contributors of *n*-alkyl moieties to the vitrinite. The resinite fraction in the lignite yielded dammar-derived pyrolysis products, as well as aliphatics and phenols as the products of admixed huminite and other liptinites. The optically defined resinite-rich fraction of the bituminous coal from Kalimantan produced abundant *n*-aliphatic moieties upon pyrolysis, but only two major resin markers (cadalene and 1,6-dimethylnaphthalene). This phenomenon is likely due to the fact that Eocene resins were not dammar-related. Data from the electron microprobe and Fourier transform infrared spectrometry strongly support the results obtained by Py-GC-MS and microscopy. Copyright © 1996 Elsevier Science Ltd

Key words—vitrinite, huminite, resinite, Tertiary Indonesian coal, analytical pyrolysis-gas chromatography-mass spectrometry, Fourier Transform infrared spectrometry, maceral separation