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Paleoenvironmental and Maturity Indicator of Sawahlunto Coal, Ombilin Basin

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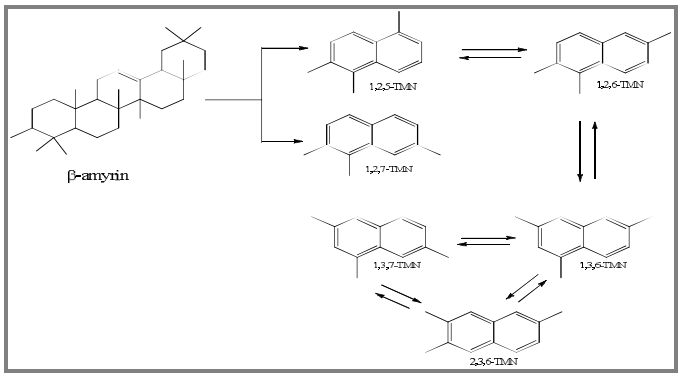
ABSTRACT

Coal geochemical studies of the Eocene Ombilin Basin were conducted through a biomarker analysis. The coal studied came from the Sawahlunto coal, West Sumatra. The coal extract was fractionated by column chromatography and biomarkers of aromatic hydrocarbon groups were identified using gas chromatography-mass spectrometry. The results showed the distribution of naphthalene compounds with sesquiterpenoid skeleton, phenanthrene compounds with diterpenoid skeletons, and aromatic pentacyclic triterpenoid compounds. The presence of sesquiterpenoid and triterpenoid compounds indicates that the organic compounds of coal are derived from the α-/β-amyrin precursors which are abundant in angiosperms and there is a contribution from bacteria. In addition, gymnosperms plants also provide little contribution on the availability of organic material which is indicated by the presence of a little amount of diterpenoid compound. Organic geochemical studies through biomarker analysis indicate that coal is mature and classified as sub-bituminous coal.

Graphical Abstract



Schematic reaction of trimethyl naphthalene isomerization

Keywords: Sawahlunto coal, Organic geochemistry, Aromatic hydrocarbon, GCMS.