
Mineral Assemblages of Volcanic and Detrital Partings in Tertiary Coal Beds, Kenai Peninsula, Alaska

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Abstract: Volcanic and non-volcanic partings are exposed in coal beds of the Tertiary Beluga and Sterling Formations along the shores of the Kenai lowland, Alaska. About two-thirds of the partings originated as air-fall tephra which fell in coal-forming swamps. The tephra partings in the Pliocene strata are unaltered or slightly altered and have a characteristic mineral assemblage of volcanic glass ± montmorillonite ± kaolinite ± opal-CT. Miocene strata are slightly altered to totally altered, and a typical mineral assemblage consists of feldspar ± kaolinite ± montmorillonite ± quartz ± crandallite ± altered volcanic glass. Crandallite appears to have formed early in diagenesis by the replacement of volcanic glass prior to the formation of montmorillonite and kaolinite.

About one-third of the partings originated primarily as detrital sediments derived from surrounding metamorphic and sedimentary terranes and were deposited by periodic floods. Mixtures of tephra and detrital sediments were also noted and were difficult to distinguish from tephra partings in the field. Detrital partings are characterized by detrital chlorite + illite + smectite + quartz ± feldspar ± siderite ± kaolinite. The chlorite in these strata is allogenic. Smectite is less common in the detrital partings.

Key Words: Chlorite • Coal partings • Crandallite • Illite • Kaolinite • Opal-CT • Smectite • Volcanic ash

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