Mica Alteration Reactions in Jurassic Reservoir Sandstones from the Haltenbanken Area, Offshore Norway

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Abstract: Petrographic observations indicate that dolomite, siderite, pyrite, Ti oxides, quartz, and K-feldspar formed as by-products of mica alteration during diagenesis of Jurassic reservoir sandstones of the Haltenbanken area (offshore central Norway). These minerals precipitated on a mica-grain scale or a thin-section scale. Modal analyses and mass-balance calculations of muscovite alteration to kaolinite and of biotite to kaolinite, illite, and chlorite suggest limited elemental mobility during sandstone diagenesis. The alteration of mica to kaolinite occurred in sandstones buried <2200 m deep (present temperature <70°C), whereas illitization and chloritization of biotite occurred during burial to depths >3000 m (present temperature >95°C).

Key Words: Alteration • Burial diagenesis • Chlorite • Illite • Kaolinite • Mica • Sandstone

Clays and Clay Minerals; December 1990 v. 38; no. 6; p. 584-590; DOI: 10.1346/CCMN.1990.0380603