
Diagenetic Illite-Chlorite Assemblages in Arenites. I. Chemical Evolution

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Abstract: Authigenic chlorites and illites coexisting in clastic reservoir sandstones have been studied by energy dispersive X-ray spectroscopy (EDS) in the transmission electron microscope (TEM). All 16 samples studied are drill or sidewall cores from sandstones of relatively uniform age situated offshore Norway with burial depths ranging between 2400 m and 5000 m and representing temperatures between 90° C and 180° C. Chlorites and illites with authigenic equilibrium type texture and morphology were analyzed by EDS. Tetrahedral Al and octahedral Fe+Mg in chlorite increases with burial at the expense of Si and vacant octahedral positions in the chlorite structure. Illites show a clear increase in K. These factors indicate that a continuous chemical modification of these minerals takes place in the diagenetic interval studied through continuous dissolution and precipitation reactions.

Key Words: ATEM • Chlorite • EDS • Illite

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