

ORGANIC CONTROLS ON CLASTIC DIAGENESIS

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Abstract:

The diagenetic alteration of clastic sediments is a major factor in determining the quality of oil and gas reservoirs. There are many possible diagenetic pathways leading to clastic bodies with different cements and different reservoir qualities. One of the controls on the pathways of clastic diagenesis is the availability of the various component ions.

In marginal marine sands montmorillonite (smectite) and chlorite are often the major diagenetic clay mineral cements. In these sands the choice of either the smectite or the chlorite pathway depends on the availability of ferrous (Fe^{+2}) iron relative to the ferric (Fe^{+3}) iron ionic species. The ferrous/ferric iron equilibrium may in turn be controlled by the availability of disseminated organic matter and the pH.