

Mineralogical characteristics of dolomite in Upper Devonian Grosmont Formation

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Porosity and permeability, controlled by carbonate diagenesis, are the most important factors of carbonate reservoir quality. The Grosmont Formation is a huge bitumen carbonate deposit located in north eastern Alberta, Canada. The Grosmont Formation is subdivided into 4 carbonate units (UG3, UG2, UG1, LG) with 3 marly interval (SB3, SB2, SB1). Petrographic features and major mineral compositions of dolomites from Grosmont Formation indicate formational difference between upper and lower carbonate unit. Upper Grosmont Unit (UG3 and UG2) were formed on the near surface environment, whereas Lower Grosmont Unit (UG1 and LG) were formed on the deep burial environment. O isotopic compositions of dolomites indicate that dolomites from Grosmont Formation were formed at the low temperature condition, ranging from 27 to 53°C. Dolomites on the western part of Grosmont Formation were formed at lower temperature condition (27 ~ 37°C), compared with dolomites on the eastern part of Grosmont Formation. Sr isotopic compositions of dolomites indicate that dolomitizing fluid of the Grosmont Formation originated from Devonian seawater.