Dolomitization for Explorationists: A Historical Perspective

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Dolomitization has always been a “hot topic” for explorationists because of the recognition that it provides a nearly ideal oil and gas reservoir rock. Ever since first identified by Déodat de Dolomieu in 1791 as the spectacular cliff-forming acid-resistant, but limestone-like, rock that forms the Triassic Dolomite Alps, debate has continued concerning the origin of dolomite.

Early impetus for the study of dolomite came from mineral explorationists and their recognition of dolomite as a common gangue mineral associated with base metal deposits before the 20th century (e.g., Tri-State District). Much of this metal-associated dolomite is very coarsely crystalline, originally described as “Pearl Spar”, and now referred to as “Saddle Dolomite”, because of its characteristic curved crystal faces.

The advent of the oil industry brought with it subsurface exploration and a greater appreciation of the widespread nature of dolomitization and the variable stratigraphic, textural and petrographic character of dolomite. Oil company research in the 1950’s and 60’s led to a good understanding of the typical finely crystalline sedimentary dolomite. But “Saddle Dolomite” remained an unexplained common associate within many dolomitized carbonate reservoirs (e.g., Parkland).

We now know, from the application of geochemical and fluid inclusion techniques that all “Saddle Dolomites” and much of the other coarsely crystalline dolomite once suggested to be a low temperature precipitates, whether associated with mineral or petroleum resources or not, have been universally precipitated at elevated temperatures (80° to >220°C) from saline to hypersaline solutions. The challenge has been place these facts within an interpretive framework.