

Fracture-Seal Diagenesis and Geochemistry as Markers of Fluid Evolution in Anticline Structures: Zagros Fold and Thrust Belt and Analogues in the Pyrenees

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Fracture-seals provide information on the kinematic evolution of structures and thus have been a main focus of structural studies. However, few studies integrate the results of structural analyses and diagenetic and geochemical investigations of the actual precipitates in the fracture-seal. This approach has been used for the study of one of the frontal anticlines from the Zagros fold and thrust belt and the Sant Corneli anticline located at the frontal zone of the southern Pyrenees. These studies are addressed to better understand the fracture-seal systems from the oil and gas reservoirs in the Zagros province (Iran).

Field mapping provides the framework of fracture development and relative timing during anticline evolution. Cathodoluminescence petrography unravels the successive stage of fracture reopening, hydraulic brecciation, dissolution and crack-seal in calcite /dolomite cements. Isotopic composition ($\delta^{13}\text{C}$, $\delta^{18}\text{O}$) and $^{87}\text{Sr}/^{86}\text{Sr}$ ratios of carbonate cements combined to fluid inclusion studies enables the reconstruction of fluid evolution along with fracture-sealing and the relationship of the different stages to oil migration.
