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Montagut Fault System: Geometry and Fluid Flow Analysis (southern Pyrenees, Spain).

Master Research Project

Reservoir geology and geophysics

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Abstract. The Montagut fault system, is part of Sant Corneli and Bóixols anticline located at the front of the Bóixols thrust belt in the southern Pyrenees, developed during the Alpine compression. Structural data in field linked to petrographic (optical and cathodoluminescence) and geochemical study has allowed to recognize four different generations of calcite cement associated to different fluid flow and deformation stages. During the layer-parallel shortening associated to early folding, fluids highly interacted with the host rocks circulated through strike-slip faults during progressive burial and precipitated cement Cc1. After that, strike-slip faults were reactivated as normal faults, and meteoric fluids mixed with hot deep-derived fluids precipitated calcite cement Cc2. During the fold growth, and after generation of stylolites, calcite cement Cc3 precipitated from more local meteoric fluids, filling re-opened microfractures and re-opening the stylolites, and representing the last stage of active compressive deformation. Cc4 has been interpreted as speleothems associated to more recent kartic processes.

Keywords: anticline, calcite cement, fluid flow, microfractures, Pyrenees.