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**Porosity Reduction Processes by Extensive Silicification in Sandstones of Miocene Age of the Montjuïc Hill (Barcelona, Spain)**

The Montjuïc hill is part of the Neogene horst and graben system of the Catalan Coastal Ranges at the northwestern edge of the Valencia Trough. It is located to the SE of Barcelona City and consists of a 200 m thick strongly silicified detrital succession of Miocene age.

Silicified facies are characterized by the presence of opal, microquartz and quartz overgrowths as well as by other minor authigenic minerals such as kaolinite, Ti and Fe oxides and alunite. Particularly, alunite and opal often appear at the boundary between the silicified and non-silicified facies.

The occurrence of alunite suggests the presence of acidic fluids with a pH between 1,5 and 4. Under these conditions, quartz solubility is unaffected, aluminium becomes mobile, aluminosilicate minerals (i.e. feldspars) are hydrolysed and clay minerals are transformed into opal CT. A feasible process which may have contributed to the acidification of fluids is the oxidation of pyrite present in the original sediments. Silicification occurred in an oxidizing environment where sulphides were oxidized and iron oxides precipitated, accounting for the reddish colour of these materials. Only shallow fluid systems driven by topographic flow can explain the oxidizing nature of the silicifying solutions in Montjuïc.

Similar silicifications are interpreted as formed by deep diagenetic processes often related with petroleum reservoirs where the fluid acidity is due to the maturation of organic matter. Consequently, the possible development of extensive silicifications in shallow environments should be also taken into account in order to evaluate potential oil reservoirs in ancient formations.