

Conodont Color Alteration (CAI), A Thermal Maturation Index and its Application to Devonian Outcrops of the Western Moroccan Meseta

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Several authors have described the origin, calibration, and geologic applications of conodont colour alteration, particularly as related to hydrocarbon and mineral exploration (Epstein et al., 1977; Harris, 1979; Harris et al., 1980, 1981, 1990; Rejebian et al. 1987; Wardlaw & Harris, 1984; and Grow et al., 1994). All these authors demonstrate that CAI is time and temperature dependent.

Devonian limestone (Lochkovian to Fammenian) in Western Moroccan Meseta are analysed by means of conodont colour alteration index (CAI). A general pattern with CAI values increasing from the west to the east of the Western Meseta can be observed. The western part of this domain (Coastal Meseta and the west edge of Central Meseta) show low to moderate CAI values (1,5-2 to 3) suggesting diagenetic conditions. A stratigraphical control in the distribution of the CAI values is inferred, but the tectonic has an indirect influence on the levels of thermal maturity. The stratigraphical interval (Lochkovian to Givetian) in this part is within hydrocarbon window. In the Central Meseta CAI value from 4 to 6 are observed, and seems related to anchizone-epizone metamorphism and/or heat associated with hercynian syntectonic igneous activity. Mixed CAI values recorded at Jbel Bouchot locality in the Mrirt area (East of Central Morocco) could be due to the effects of hydrothermal fluids. Textural analysis of the conodont elements favour this possibility.

Key words: Conodont - Devonian - Meseta - Thermal maturation- CAI