

ALTERNATING GROWTH OF HEMATITE AND BOEHMITE IN CRETACEOUS KARST BAUXITES FROM SOUTHERN ITALY: A CLUE FOR GROUND-WATER TABLE FLUCTUATION.

MONGELLI G. Centro di Geodinamica, Università degli Studi della Basilicata, via Anzio, 85100 Potenza, Italy.

In the mediterranean area Cretaceous karst bauxites are widely diffused and in the southern appennines (Italy) they mark a Late Cretaceous period of emergence of shallow-water limestones during wet tropical climate. This platform drowning coincide with the tectonic rearrangement, from extensional to compressional, of the Tethyan region. In the Apulia Carbonate Platform the bauxite, filling karsts with steep and deep walls, occurred in a Neocomian-late Cenomanian limestone. The bauxites are formed by a fine-grained kaolinite-rich matrix which embedd iron-rich spheroidal concretions. The genetic model of formation involves accumulation of clay material in the karst, in situ bauxitization at the expense of the clay and late formation of the concretions in a pedogenic environment. The concretions usually have a well developed core, compact and unfissured, formed by Al-hematite, and a regular banded cortex of alternating Al-hematite and boehmite. Boehmite may form instead of Al-hematite at high values of the $a\text{Al}^{3+}/a\text{H}^{+}$ ratio coupled with lower values of water activity possibly related to fluctuation of the ground-water table. The growth of ferrous concretions in a tropical climate is a transport-controlled phenomena, mostly involving replacement at the expense of kaolinite and the time necessary for growth of the concretions can be calculated. The results obtained, based on a simple model of molecular diffusion and assuming negligible the fluid flow, suggest the time required for the growth of alternating minerals in the concretions is consistent with fluctuation of the ground-water table.