



Spectroscopic study of the incorporation of manganese in calcites from sediments and fissure fillings from Tournemire (Aveyron, France): inferences on redox conditions during calcite formation.

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The Tournemire site has received much attention for safety assessment of deep radioactive waste disposal in argillaceous medium. It is located in a Mesozoic marine basin on the Southern border of the French Central Massif. Toarcian argillites and marls are affected by some faults and fractures of natural (tectonic) and artificial (excavation) origin. We have investigated the incorporation of Mn^{2+} in calcites by Electron Paramagnetic Resonance (EPR). A specific protocol has been established to assess the Mn^{2+} concentration of calcites. The redox formation conditions of the calcites from the Toarcian sediments and fracture fillings are discussed using a systematic comparison between the total Mn- and the Mn^{2+} content of calcites. Sedimentary and fissural calcite may easily be distinguished. The former do not appear to have been significantly affected by diagenetic effects, as the latter have formed under more reducing conditions.