

A case study of barite as a stratigraphic tool: an indicator of pauses in sedimentation?

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ABSTRACT

The stratigraphy of fine-grained sediments provides many challenges. Condensed intervals are often difficult to identify and erosional surfaces evident in shallow strata are difficult to link with their time correlative conformities within deeper basin strata.

Barite nodules provide important clues about diagenetic environments, paleo-biologic productivity, and consequently source rock potential. In particular, barite nodules have been documented from oxic-anoxic boundaries and sulphate-reducing environments. Pauses in sedimentation have been linked with stable oxic-anoxic boundaries allowing the creation of barite nodules. In the Marnes Bleues Formation of the Vocontian Basin (SE France), barite nodule horizons within basin sediments have been correlated with shallower condensed intervals and discontinuities (Bréhéret and Brumsack, 2000).

The Lower Jurassic Nordegg Member of west-central Alberta contains numerous barite nodule horizons. The nodules range in shape from rosettes, rhombs, lozenges and birdfoot shaped concretions to discs. This study examines the origin of the precursor barium as well as the textural relationships between the barite and the host sediment. The lateral extent of barite horizons as well as their association with paleosol horizons and displacive fibrous calcites (shales with beef) are also examined. Regional cross-sections are used to determine the relationships between barite horizons, known condensed intervals and unconformities. Finally, the utility of barite as a stratigraphic tool is addressed.

References

Bréhéret, J.G., Brumsack, H.J., 2000. Barite concretions as evidence of pauses in sedimentation in the Marnes Bleues Formation of the Vocontian Basin (SE France), *Sedimentary Geology*, v. 130, p. 205-228.