Pyrite framboid analysis from the Sinemurian–Pliensbachian Água de Madeiros Formation (Lusitanian Basin, Portugal)

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The Upper Sinemurian–Lower Pliensbachian Água de Madeiros Formation of the Lusitanian Basin (Portugal) is characterized by the pervasive occurrence of organic rich facies (e.g. [1]). In this study, we have examined more than 20 samples of this unit from the S. Pedro de Moel composite section (central Portugal), aiming to provide a more comprehensive view of the paleoceanographic conditions leading to the deposition of the organic-rich intervals. The samples were examined in polished thin sections using a JEOL 8200 Superprobe set in backscatter mode at the Robert M. Mackay Electron Microprobe Laboratory (Dalhousie University). More than 100 pyrite framboid size were measured per sample (e.g. [2]).

In the studied section of S. Pedro de Moel, pyrite framboids range from 0.05 to more than 15 μm. To evaluate the redox conditions we used the upper envelope defined by the Q3 and compared our results with the boundaries proposed from pyrite petrographic criteria to distinguish a spectrum of oxygen-related facies (e.g. [3]). The data suggest these organic-rich facies were deposited under a strongly oxygen deficient depositional system, sometimes with a euxinic water column.

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[1] Duarte *et al*. (2012) *J Petrol Geol* **35**, 105–126 [2] Wignall *et al*. (2010) *Glob Planet Change* **71**, 109–123 [3] Wilkin *et al*. (1996) *Geochim Cosmochim Acta* **60**, 3897–3912