Strategies for Identifying Organic Matter Types in SEM

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ABSTRACT

Solid organic matter is easily identified in scanning electron microscope (SEM) images acquired from flat, smoothly polished surfaces (e.g., Ar-ion milled) by its characteristic low secondary electron yield and low backscatter intensity; appearing dark gray in standard grayscale images. However, SEM is poorly suited for interpreting specific organic maceral and kerogen types as described by optical petrographic or geochemical methods.

Lack of consistent and standardized descriptions of organic matter in SEM has led to confusion and controversy in the characterization of organic composition, interpretations of the origins of pores in organic matter, and organic diagenesis.
This paper describes a practical method for the description and classification of organic matter in SEM and various strategies used to help bridge the gap between optical and electron microscopic characterization of organic matter in carbonaceous mudstones.