Glauconite Character and Ichnofabric Signature of Parasequences within Condensed Sections in Passive Margin Settings

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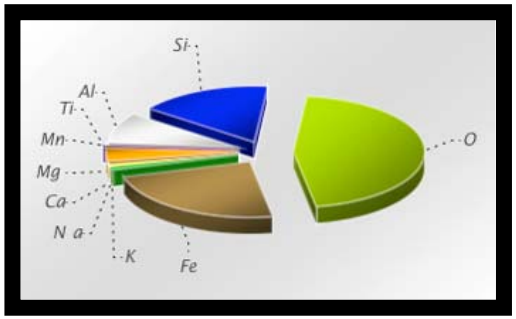
Sedimentary units rich in glauconite and other green marine clay minerals, commonly known as "greensands", are linked with marine transgressions in association with condensed sections in terrigenous depositional environments. The principal objective of this project was to interpret the depositional conditions associated with the formation of greensands based on trace fossil associations, ichnofacies and ichnofabrics along with mineralogic evaluations. Focus was on two widely separated parts of the geologic column in three different localities – Cambrian greensands in central Texas and southern Wisconsin, and Eocene greensands in eastern Texas – including field work in Texas and Wisconsin and laboratory analytical work at the University of Utah. Glauconite and other clays were characterized using XRD (X-ray Diffraction), QEMSCAN (Quantitative Evaluation of Materials with Scanning Electron Microscopy), electron microprobe and thin section analysis. Glauconite and other green clays are predominately pelletal and are indicative of an *in situ* reworked origin rather than an allochthonous origin accompanied by appreciable transport. Trace fossils in the Eocene greensands include mainly crustacean burrows (*Gyrolithes*, *Thalassinoides* and *Spongeliomorpha*), while trace fossils in the Cambrian greensands include mainly worm burrows (*Skolithos*, *Planolites*, *Palaeophycus* and *Diplocraterion*). In all cases, the trace fossil associations are typical of the *Skolithos* and *Cruziana* Ichnofacies and are consistent with a shallow-marine paleoenvironment. The ichnofabrics reveal total bioturbation of the sediment, including pelletization of the marine clays.

Thin section of pelleted greensand, Eocene, eastern Texas



Geochemical analysis of pellets, Eocene, Eastern Texas