Microscopic Distribution of Uranium in Oakville Sandstone, South Texas

When uranium ore is mined and processed in the conventional crushing plant there is little urgency to know what mineral contains the uranium and how that mineral is distributed within the ore. However, solution mining techniques depend for their success on bringing the dissolving solutions into contact with the uranium-bearing mineral and dissolving it. With that requirement in mind, a study was undertaken to help understand the character and location of the uranium-bearing mineral in the Oakville Sandstone of south Texas where solution mining is being carried out.

Thin-section and electron-microprobe analyses were conducted on a sample of high concentration ore to confirm that uranium was located in the space between framework sand grains. Moreover, uranium was not uniformly distributed throughout the silt and clay intergranular matrix material. The disaggregated and fractionated sandstone showed the highest concentration of uranium to be in the silt-size fraction. Further separation of the ore was carried out by heavy liquids and magnetic fractionations. The uranium-bearing mineral was concentrated along with dense and magnetic minerals. Openwork intergrowths of pyrite crystals made up most of this fraction. In spite of having concentrated uranium in excess of 43,000 ppm U_3O_8, it was still not possible to identify any uranium-bearing mineral by X-ray diffraction. This suggests that uranium may be held in the sandstone as an amorphous oxide.

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Integration of Microscopic Organic Analysis and Geochemical Measurements in Evaluation of Source Rocks

A major problem facing all scientists working in the field of source rock evaluation is choice of an analytic mix which yields necessary and sufficient data that are dependable, economical, and not unnecessarily redundant. Chevron handles this problem by combining microscopic observations with measurements of the total organic carbon (TOC) and the hydrogen-carbon (H/C) ratio of the organic matter (OM). This combination of analyses yields two independent estimates of organic quantity, quality (type), and maturation, the three organic parameters which are necessary for a proper source-rock evaluation.

Despite the strong subjective element, we consider microscopic organic analysis (MOA) indispensable to an accurate evaluation of organic quality and maturation. In addition, MOA is useful in detecting analytic errors in geochemical measurements, uphole cave, contamination from organic well additives, and the presence of reworked OM. MOA is, however, quite subjective and requires continuous calibration against geochemical numbers to minimize errors in judgment.

Geochemical analyses of kerogens are objective, precise, accurate, lend themselves readily to comparison between different laboratories, and are appealing both to geologists using source-rock data and to management. However, most of them are bulk measurements and cannot resolve the kerogen into its components as can microscopic analysis. In addition, many geochemical measurements do not discriminate between effects due to maturation and effects due to different organic types.

Used together, MOA and geochemistry strongly complement each other and minimize the possibilities of incorrect interpretation of the generative potential and generative history of the OM.

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Predictions of Oil or Gas Potential by Near-Surface Geochemistry

No abstract available.

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Interactive Modeling and Interpretation of Two-Dimensional Gravity and Magnetics Data

The number of possible interpretations of a gravity or magnetic profile is reduced by the presence of other geophysical or geologic data. Experience, common sense, and a newly developed interactive modeling program make it possible to examine and choose among those that remain. The interactive modeling program is based on Talwani's algorithm and includes features which make it possible to change the geometry and properties of the causative bodies and quickly observe the results.

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Bathymetric Distribution of Trace Fossils in Upper Pennsylvanian and Lower Permian, Western Oquirrh Basin, Utah

Detailed study of the Oquirrh Group in Tooele and Box Elder Counties, Utah, has revealed a history of basin development during the Late Pennsylvanian and Early Permian. Trace fossils are of paramount significance in recognizing depositional environments in this sequence (a) because of uniform composition and uniform grain size and (b) because most megafossils were redeposited several miles or more from their initial growth sites.

Middle Pennsylvanian littoral and inner-shelf limestones and quartz arenites form the base of the sequence studied. During Late Pennsylvanian time, the western Oquirrh basin area was primarily an outer-shelf environment. Trace fossils in shelf units are diverse, recording a variety of behavior patterns, and include *Zoophycos*, *Teichichnus*, and *Helminthoida* in the Hogup/Terrace Mountains and *Zoophycos*, *Phycodes*, *Helminthoida*, and *Spirophycus*(?) in the Grassy Mountains.

Rapid subsidence in latest Pennsylvanian–earliest Permian time is marked by conglomerates and arenites that carried shallow-water fossils into the bathyal envi-