

## **Composition and transformation characteristics of clay minerals in alkaline lacustrine basins**

WEN QI<sup>1</sup>, JIA WU<sup>2</sup>, JIE BAI<sup>1</sup>, SHUXIN PAN<sup>1</sup>, ZHIYONG LI<sup>1</sup>

<sup>1</sup> Research Institute of Petroleum Exploration and Development-Northwest, PetroChina, Lanzhou, 737000, China

<sup>2</sup> China University of Petroleum, Beijing, 102249, China

As a type of extreme environment, alkaline lakes have been investigated on the productivity, sedimentary environment, saline mineral composition and organic matter, but clay minerals. As a significant component in source rocks and oil shale, clay minerals are reported have special compositions and transformation in alkaline lacustrine source rocks in this study.

Both argillaceous sediment from modern alkaline lakes and source rocks from ancient alkaline sedimentary basins are studied, as well as samples from non-alkaline lakes. Compared with non-alkaline lacustrine samples, the alkaline sediments show, (1) Lower total clay content, usually lower than 10% of ancient samples. (2) Higher content of illite/smectite mixed interval. According to X-ray diffraction, the value can be up to 90% in depth more than 3800m. (3) Opposite to illite/smectite mixed interval, the content of illite is lower. In addition, the ratio of mixed-layer is higher. The distribution indicates that illitization in alkaline lacustrine sedimentary environment is impeded, and is contradictory to traditional understanding which considers that all smectites will be converted into illite as the burial depth increases.