

SAMPLING PREPARATION AFFECTS THE RATIOS OF CLAY MINERALS ACCORDING TO THE XRD INVESTIGATION.

Viktoriya Krupskaya^a, Tatiyana Alekseeva^c, Vyacheslav Sokolov^b,
Irina Andreeva^d, Aleksey Krylov^d, Lidiya Levitskaya^a, Vladimir Novikov^a

^aInstitute of Ore Deposits, Petrology, Mineralogy and Geochemistry, Russian Academy of Science, Moscow; ^bShirshov Institute of Oceanology, Russian Academy of Science, Moscow; ^cMoscow State University, Geological Faculty, Russia; ^dInstitute of Geology and Mineral Resources of World Ocean, St. Peteresburg, Russia

Clay minerals provide the most important information for geological and geo-ecological investigations. The Biskay method [Biskay, 1965] is a widely used method for the estimation of the main group of clay minerals in the modern practice of marine geology, soil science and geoecology. This method is based on the XRD measurement of the integral intensities of basal (001) reflectors of the ethylene glycol saturated illite, smectite and kaolinite followed by the normalization with the special factors which were developed by Biskay for marine sediments. Different conditions for disintegration of samples and realization of the XRD method are used in the laboratories of Russia, Germany and other countries. However, it is not clear whether these working conditions affect the final result of analyses. The main goal of present work was to estimate the effect of these working conditions on the results of clay mineral ratios. Of major interest, the monomineral samples (bentonites, kaolinites) and samples of clay fraction <2 um from Arctic Ocean sediments (from the Lomonosov and Mendeleev Ridges) have been utilized for this study.

Several series of samples were prepared to compare the conditions which have been used by different laboratories: different time of ultrasonication (1, 5, 10, 15 and 30 min), Na-tripoliphosphate treatment in suspension and paste, abrasion in porcelain mortar with alcohol (10, 15 and 30 min), abrasion in vibrating mill (10, 15 and 30 min). The oriented preparations were made from each sample and investigated on "Rigaku" X-Ray diffractometer D/MAX 2200 with Cu monochromatic radiation.

We found that different slit conditions do not influence results of the estimation of clay mineral ratios, whereas the Na-tripoliphosphate treatment has the most effect on the variation of the results. Therefore, it is necessary to know the conditions of sampling treatment and features of the sampling preparations for the correct use of the Biskay method and Biskay factors for correlation of deposits.

This work was supported by Russian Foundation for Basic Research (grant # 07-05-96035_r), grant of President of Russian Federation for young scientists (MK 07-05-96035) and Russian Science Support Foundation for young scientists.