MICROFABRIC OF MUDROCKS: OBJECTIVE MEASUREMENT AND CLASSIFICATION

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Mudrocks microfabrics are diverse and this diversity is the effect of sedimentation environment and of the processes taking place in sediment before, during and after burial. In the case of hydrocarbon source rocks the fabric analysis is of practical importance.

In these study procedures were applied enabling simple and rapid measurement of ordering of the rock expressed as the mode of arrangement of its clay and non-clay components (mainly quartz, mica and carbonate grains, as well as fragments of carbonised organic matter). To obtain a complete picture of rock fabric, the spatial distribution and particle to particle relation as well as the size and shape of pore space were also measured.

Seven samples of mudrocks were selected for model studies, showing qualitatively distinctly differing fabric. These samples represent rocks of different age from Lower Carboniferous to Tertiary. They were formed in different sedimentary environments: continental (fluvial, lacustrine) and marine (shelf facies and sediments redeposited from shelf). They are characterised by similar of different composition of clay minerals, grains of coarser fractions than clay, carbonate content and advancement of diagenetic processes. Two of them are considered to represents hydrocarbon source rocks.

The studies were carried out on three preparations from the fragments of rocks: thin sections for optical microscopy, standard SEM preparations and polished samples for SEM-BS investigation. In elaborating the pictures fixed on microphotographs the mathematical morphology methods were used accessible in the APHELION program.

These studies resulted in the proposal of quantitative scheme of classifying the fabric observed in optical and electron microscopy (SEM and SEM-BS).

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