Compositional differences between Besko and Otryt sandstones of the Krosno Beds (Oligocene) in Eastern part of the Silesian Tectonic Unit

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sample 3.76 (Bouma Tc interval; both values being expressed in phi scale units). Therefore the upper sample represents deposition from a more diluted current (of lower flow competence) than the bottom sample. Less good sorting in the finer grained upper sample reflects pronounced contrasts in grain-size between individual laminae of the current-ripple cross-laminated Tc interval.

Both samples of the Otryt facies sandstone show relatively high content of unstable grains, therefore this rock has low mineralogical maturity. Except for solitary well-rounded coarse grains, the bulk of grains are poorly rounded, which documents low textural maturity. The bottom sample of the Otryt facies is richer in grains of coarse to very coarse metamorphic rock fragments and polycrystalline quartz than the top-of-bed sample. Texturally, both samples are poorly sorted. This is shown by very similar standard deviation values (bottom 1.18; top 1.12). The values of graphic mean grain size range from 1.68 (bottom) to 1.92 (top). Furthermore the grain-size distribution curve of the sample from the bed bottom is characterised by coarse-tail, whereas the upper sample distribution is devoid of coarse-tail. These values and their distributions imply grain-size sorting by a high-density turbidity current unable to separate the various grain-size classes present in the flow. In such flows only the coarsest fraction is present initially but the remaining spectrum of the grains remains unchanged throughout the depositional process (Shideler et. al. 1975).

A comparison between the two sets of samples shows the influence of two different flow types expressed by notable differences in grain size and sorting. The Besko facies sandstone is finer grained due to having been deposited from a more diluted current of lower competence. Furthermore, the Besko facies sandstone must have been deposited from a gradually decelerating current whereas the Otryt facies sandstone was deposited rapidly by denser turbidity current in which grain-size sorting affected only the coarsest grains. As a consequence grain orientation parallel to the flow direction is more distinct in the Besko facies than in the Otryt facies sandstones.

REFERENCES


