

## Black shale formations as geochemical markers of tectonic setting along active plate margins?

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Black shales represent unique sedimentary archives providing important clues into the marine conditions throughout the Earth's history. In the ~635–520 Ma Blovice accretionary complex, Bohemian Massif, black shales [I] form meters to tens of meters thick stratiform bodies within the siliciclastic successions, [II] occur in close proximity to volcanic bodies of arc, OIB-like and MORB-like compositions, or [III] form cm-sized fragments within the graywacke matrix ('block-in-matrix' fabric). Here, we present combined major/trace element and Mo ( $\delta^{98}\text{Mo}$ ) isotopic data that show some significant differences among these three different suites of black shales. The **Type I** black shales undergone common strong silicification resulting in high Sr and Ba, exhibit well-defined negative correlation between  $\text{SiO}_2$  and other oxides, contain the lowest amounts of most incompatible trace elements (e.g., REE, Nb, Rb, Th, U) and predominantly yield largely negative  $\delta^{98}\text{Mo}$  values (< down to  $-1.1\text{‰}$ ) suggesting markedly oxic conditions during their deposition. In contrast, the **Type II** black shales are characterized by the highest LREE enrichment paralleled by the lowest  $\text{SiO}_2$  (< 65 wt. %). Finally, the **Type III** black shales have homogenous  $\text{SiO}_2$ , but large range of  $\text{Al}_2\text{O}_3$  and low MgO and  $\text{P}_2\text{O}_5$ , the highest Ba. The Type II and III shales contain high TOC (up to 7 wt. %) and yield largely positive  $\delta^{98}\text{Mo}$  values (up to  $+1.0\text{‰}$ ) suggesting deposition in anoxic–euxinic conditions. In conclusion, we suggest that these three different geochemical compositions are sensitive markers of diverse and temporally changing tectonic settings on an oceanic plate: (1) black shales overlying a volcanic island arc (**Type I**), (2) black shales deposited on the seafloor in association with MORB (**Type II**), and (3) black shales associated with terrigenous trench-fill turbidites (**Type III**).

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[1] Hajná (2019) *Gondwana Res*, 10.1016/j.gr.2018.10.010,

[2] Ackerman et al. (2019) *Gondwana Res*, under review.