On the Geochemistry of the Danube River Sediments (Serbian Sector)

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The mass fractions on nine major elements as oxides—SiO_2, TiO_2, Al_2O_3, FeO, MnO, MgO, CaO, Na_2O, and K_2O, as well as Sc, V, Cr, Co, Ni, Cu, Zn, As, Rb, Sr, Zr, Sb, Cs Ba, La, Hf, Ta, W, Th, and U were determined by Instrumental Neutron Activation Analysis (INAA) in 13 sediment samples collected between Belgrade and Iron Gate 2 dam to get more confident data concerning the geochemistry of the unconsolidated bottom sediments one one hand, and to quantify the presence of Presumably Contaminating Elements (PCE) in the Serbian, on the other.

INAA was chosen for its ability to perform elemental analysis without any preliminary sample treatment that could induce systematic errors. The distribution of major elements was relatively uniform, sampling locations having less influence. In the case of trace elements, with the exception of PCE: Cr, Ni, Cu, Zn, As, and Sb, their distributions presented the same remarkable similarity to the Upper Continental Crust (UCC), North American Shale Composite (NASC), Average Bottom Load (ABL), and Average Dobrogea Loess (AVL), suggesting a good concordance with the position of the Serbian Danube River in the Pannonian Plain.

In the case of investigated PCE, both Enrichment Factor and Pollution Load Index showed values higher than the pollution threshold, which pointed towards a significant anthropogenic contamination, and rising concern to what extent the water quality and biota could be affected.