Mercury and arsenic at the redoxcline of the Black Sea

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The Black Sea is a very suitable site to investigate the marine geochemical cycling of trace elements at redoxcline. This oxic-anoxic interface is permanent around between 100 and 200 m depth. We present here detailed profiles (10–1400 m) for dissolved (0.4 μm) mercury and arsenic from one station located in the Northwestern Black sea (44°25′N; 32°11′2E) which has been occupied in summer 1995 during a cruise of the *EROS-2000* project (Environment RTD Programme of the European Union). Mercury concentrations varied from 0.12 pM in surface waters to 6.15 pM at the redoxcline; the concentrations were lower than 3.75 pM in the anoxic zone. Arsenic concentration varied from 18.3 nM in surface waters to 44.7 nM at the redoxcline; concentrations in the anoxic were relatively stable around 40 pM. Both mercury and arsenic profiles exhibited a maximum coincidental with the dissolved iron peak. A secondary peak was observed for both elements at the basis of the manganese gradient. The concentration gradients at the redoxcline are interpreted in terms of scavenging, partial regeneration and diffusion. In the oxic layer, the arsenic distribution suggests removal and mixing. In the case of mercury, a subsurface bulge in the profile suggests elemental mercury formation. The redoxcline would supply the dissolved Hg(II) necessary for this reaction, the atmosphere being a sink for Hg8.