



On the reasons of the absence of overlap between oxygen and hydrogen sulphide at the water column redox interfaces: comparative study for the Black Sea and Oslo Fjord

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Present in the seawater dissolved oxygen is a key element that determines the balance of oxidants and reductants in the redox-layer of the Black Sea. Meanwhile, the accuracy and detection limit of the oxygen technique is an acute problem for studying the processes that occur in the redox zone. It became possible to significantly increase the accuracy of measurements of dissolved oxygen in the 1990s, because oceanographers started to use the 5-L PVC Niskin bottles instead of 1-L bottles. Another factor is using of argon-filled balloons attached to the upper valves of Niskin bottles, that allows protecting the samples from contamination with atmospheric oxygen. During the 100th cruise of RV "Professor Shtokman" to the Black Sea and the Oslo Fjord 2008-2009 studies we had possibility to measure dissolved oxygen together with redox metals present in the sea water (Mn(IV), Mn(III); Fe(III)). The correction for these oxidants allows to demonstrate that standard Winlker technique gives values increased up to 3-5 μM . The studies performed confirmed the absence of the layer of co-existence of oxygen and hydrogen sulphide. Such a structure is stable because oxidized forms of redox metals serve as an obstacle for upward diffusion of hydrogen sulphide.