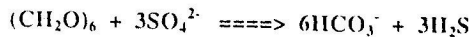


ON THE REMOVAL RATES OF H<sub>2</sub>S IN SAKARYA CANYON REGION  
OF THE BLACK SEA

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Whenever the rate of supply of oxygen in natural waters can not cope with its consumption rate in organic matter oxidation, redox gradients developed and reducing conditions occur. Formation of H<sub>2</sub>S occurs in a variety of natural waters by the catalytic actions of sulfate-reducing bacteria under anaerobic conditions during the oxidation of sinking organic matter through sulfate reduction by the simple equation given below.



Oxic/anoxic boundaries of the stagnant, land-locked basins, especially that of the Black Sea has been of great interest to marine chemists because of its complicated chemistry and the opportunities offered for studying the redox processes. Although the biochemical oxidation of H<sub>2</sub>S within the transition zone of the Black Sea has been studied by many workers (Skopintsev et al. 1959; Sorokin, 1971; Fashchuk and Ayzatullin, 1986; Leonov and Ayzatullin, 1987; Millero, 1988,1991; Luther et al. 1991), there are, still, many questions about the spatial and temporal variations in the properties of the oxic/anoxic transition zone. Solution of these problems depends, particularly, on the accuracy of the H<sub>2</sub>S determination and on the oxidation kinetics of it.

In an attempt to understand the redox processes and mechanisms of H<sub>2</sub>S removal within the suboxic zone of coastal frontal zones, a process oriented joint survey was conducted during June-July 1997 cruise of R/V Bilim along a transverse transect where stations were located 5 km apart in the offshore direction in the region close to Sakarya Canyon which is located at the south western Black Sea.

Field measurements made for the determination of H<sub>2</sub>S removal rates within suboxic zones of dynamically different regions of the Black Sea showed that, the average removal rate through biochemical processes within the rim current frontal zone ( $t_{1/2} = 2.64$  hours) is faster than those measured in the anticyclonic eddy ( $t_{1/2} = 3.03$  hours) and offshore region ( $t_{1/2} = 3.21$  hours). Factors responsible for these different oxidation and/or removal rates are not known exactly at present. However, the possibility of direct oxidation by the dissolved oxygen diffusing from the overlying oxic zone seems to be improbable, since at least 10 times faster H<sub>2</sub>S oxidation rates in deep Black Sea compared to surface waters with added H<sub>2</sub>S, and the similarities between the rates of oxidation of filtered and unfiltered samples under oxic (150-200 µM DO) Millero (1991) and suboxic oxygen levels (DO<50 µM) (Gökmen, 1996) imply that the oxidation of H<sub>2</sub>S is abiotic in nature and O<sub>2</sub> is not a direct oxidant for H<sub>2</sub>S.