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DI(2-ETHYLHEXYL)PHTHALATE IN LAKE BAIKAL

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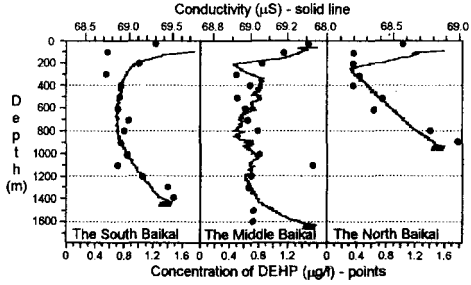
Renewal of the deep waters of Lake Baikal occurs twice per year, in spring, and in autumn, when large masses of surface waters penetrate to the bottom, down to maximum depths. This process can be studied by chemical tracers along vertical profiles. Stable chemical pollutants delivered to the lake from the atmosphere, like freons, may be used as such tracers. Concentrations of freons in the atmosphere continuously grow since the 1950-ies, and for this reason their concentrations at different depths in the lake give an estimate of the "ages" of waters, i.e., tell us how long ago given water parcel has been at the surface, at an equilibrium with atmospheric freons [1]. We attempted to use di-(2-ethylhexyl)phthalate (DEHP) as a tracer for studies of the exchange of deep waters of Lake Baikal. DEHP is stable in the environment. Its concentration in surface waters, equal to 1 μg/l, is some 1000 times greater than that of freons. A significant complication with DEHP are problems of contaminations and adsorption. DEHP is ubiquitous, and sticks to laboratory glassware. Storage of Baikal water, even in tightly stoppered glass bottles, results in an increase of the concentration of DEHP to 20-25 μg/l already in 10 days. DEHP can be removed by heating of glassware at 400°C, but after this glassware begins to adsorb it from water of sample.

In order to overcome these difficulties, studies of the distribution of DEHP in Baikal waters were done directly on board of research vessel *Titov* (September, 1996) by means of a portable liquid chromatograph Milichrom A-02 [2] using RP HPLC (column 2x75 mm, Nucleosil 5-C18; ACN:water (9:1); F=0.2 ml/min; T=50°C; UV-detection at λ=200 nm; volume of sample 10 ml. The estimated statistic error of the analysis was ± 0.05 μg/l.

The vertical profiles obtained have much in common with these of freons, reveal fine structure features ("noise"), which is not due to analytical errors, but rather reveals unhomogeneity of Baikal waters even in September, when Baikal is strongly stratified, with its waters warm over the upper layer of ca. 25 m. The presence of this fine structure is confirmed by temperature profiles measured in parallel by a highly sensitive CTD probe (Sea Bird Electronics). Hence, DEHP is a promising chemical tracer for Baikal. Studies of its fate and distribution will be continued. These results suggest that other chemical pollutants, like DDT and PCBs, may also be distributed very unevenly in waters of Lake Baikal.



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