

WATER TREATMENT TECHNOLOGIES FOR THE PROTECTION OF THE DANUBE RIVER

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In recent years, pollution of Ukrainian rivers, including the Danube river, has grown. This is due to the discharge of industrial, household and agricultural wastewater. The inflow of wastewater causes the contamination of rivers with different pollutants. It is worth to note the recent marked increase of iron, copper, zinc and nitrogen compounds. The concentrations of these compounds exceed sanitary standards. To use this water for drinking purposes, one needs to employ costly additional technologies for special treatment. It is much cheaper to prevent contamination upstream than to purify water downstream.

Wastewater from industrial plants contains substantial amounts of heavy metals. These highly toxic substances are converted into solid sludge. In Ukraine, the sludge obtained after reagent treatment, compaction and dewatering is not usually utilised. As a result, water supply facility sites are polluted. This causes major environmental damage.

Several low-waste and waste-free technologies for recycling of heavy metals have been developed and patented. These technologies have been implemented at several plants near Kiev. The technologies promote recovery of up to 98% of Ni, Zn and Fe with by-production of solvents, pigments and ground enamel coatings. Wastewater and solid waste are considered valuable resources to replace expensive raw materials, using closed industrial water supply systems. Those methods allow the continual improvement of the Danube river basin.

Dr. **Gennady M. Kocherov** is Associate Professor and Senior Research Associate at Kiev State University. He has published many papers in major scientific journals and conference proceedings, and has developed several patents and educational aids. His fields of research include chemistry, environmental protection, wastewater treatment, metals recycling and chemical technology. He has delivered lectures and workshops on physical chemistry and on physical and chemical research methods, and he is an expert in electron-beam evaporation techniques, X-ray diffraction and electron microscopy.