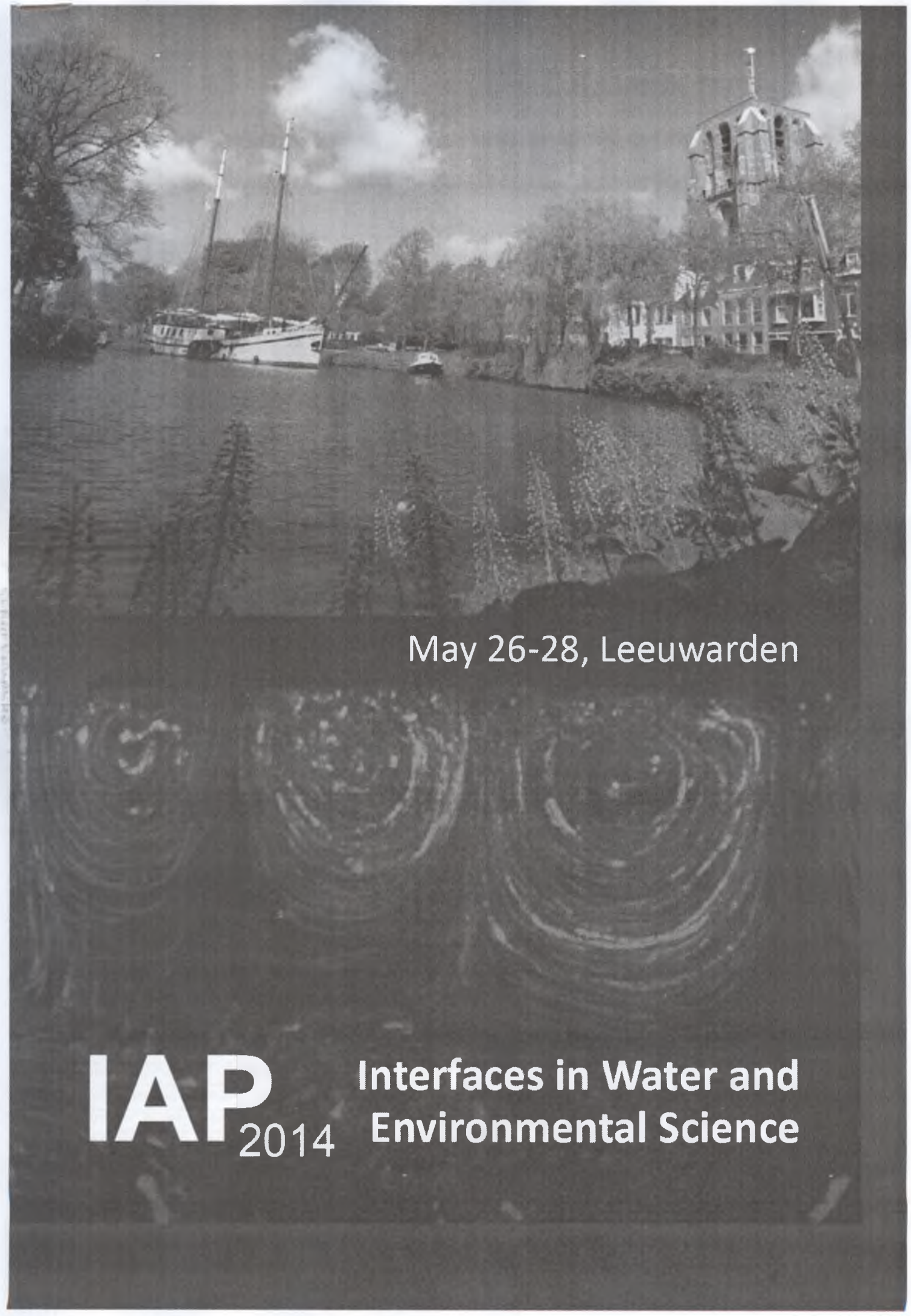
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Biocomposites on the base of yeast cells and diatomite such as sorbents of metal ions

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The problem of wastewater treatment is one of the most actual problems of modernity. Especially also extremely actual problem is cleaning wastewater of metallurgical industries from the metal ions. Natural minerals and synthetic ion-exchangers are widely used for remove the metal ions. Alternatively, they may serve as microorganism cells containing on its surface a different of functional groups like amine, carboxyl, hydroxyl, phosphate, sulfide, sulfhydryl, etc.

Were conducted experiments on the adsorption of ions Cu^{2+} and Pb^{2+} on the surface of yeast cells *Rhodotorula glutinis*. It has been shown that at the initial concentrations in the range of salts of Cu^{2+} and Pb^{2+} from 10^{-6} to 10^{-1} mol/l the removal degree of metal ions varies between (95.2 and 98.3)% to (50.1 and 59.7)% for ions Cu^{2+} and Pb^{2+}, respectively. In this case the adsorption equilibrium is reached after 30 minutes.

Method of IR spectroscopy shows that the interaction of yeast cells with ions Cu^{2+} and Pb^{2+} is realized by amino-, phosphate, carboxylic and hydroxyl groups of the surface, the ions Cu^{2+} are dominant donor-acceptor interaction with amino groups and ions Pb^{2+} - ion exchange with the phosphate and carboxyl groups. Due to the high lyophilic surface of cells their separation from solutions difficult. Therefore were carried out experiments to immobilize the cells Rhodotorula glutinis on the surface of natural mineral diatomite. Diatomite also has high sorption capacity with respect to the ions Cu^{2+} and Pb^{2+}, but does not provide complete water treatment. The removal degree of Cu^{2+} and Pb^{2+} ions by diatomite in the concentration range of their salts 10^{-5}-10^{-1} mol/l is (92.1-15.6)% for Cu^{2+} ions and (95.6-20.3)% for Pb^{2+} ions.

Experiments to immobilization of Rhodotorula glutinis cells showed that the attachment of cells to solid surfaces most efficiently at the surface of diatomite provisional modifications of polyethylenimine solution with a concentration of 0.03 base-mol/l. Modification of mineral surface with cationic polymer creates favorable conditions for attachment thereto of negatively charged cells of microorganisms. It is shown that by using the obtained composite biosorbent to remove of Cu^{2+} and Pb^{2+} ions from solutions the treatment degree of water is reaches 97.8-99.4 %.