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Adsorption of Lead(II) and Cadmium(II) ions on the surface of a cellulose membrane modified with denaturated deoxyribonucleic acid

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Abstract

The sorption of Pb(II) and Cd(II) ions on a nitrocellulose membrane modified with denaturated deoxyribonucleic acid (d-DNA) was studied. A method for constructing isotherms of adsorption of heavy metals on the surface of an amperometric biosensor incorporating a d-DNA-modified nitrocellulose membrane and a stationary mercury-film electrode was proposed. An analysis of isotherms of joint sorption of Pb(II) and Cd(II) from a mixture of these ions showed that Pb(II) is bound to d-DNA more strongly than Cd(II), in agreement with the theoretical assumption that there are additional modes for binding Pb(II) with nitrogen-containing heterocycles of the d-DNA molecule. The constants of binding of Pb(II) and Cd(II) on d-DNA were determined by the Scatchard method.
