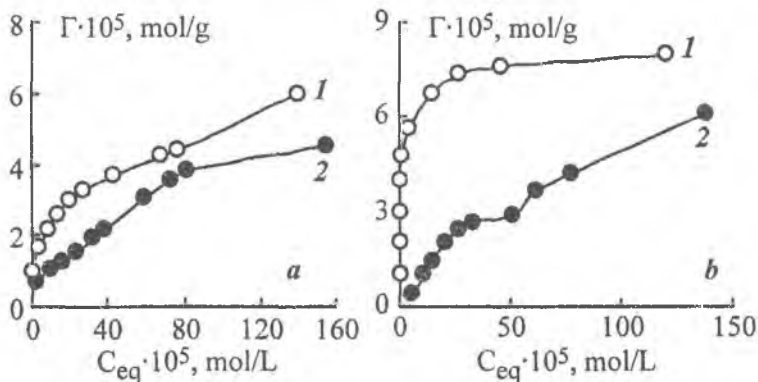


Some features of Pd(II) and Cu(II) adsorption with bentonites and activity of bentonite based catalysts in the reaction of carbon monoxide oxidation

T.L. Rakyts'ka¹, V.O. Vasylechko², T.O. Kiose¹, G.M. Dzhyga¹, G.V. Gryshchouk², V.Y. Volkova¹

¹Faculty of Chemistry, Odesa I.I. Mechnikov National University, 2, Dvoryanska St., 65082, Odesa, Ukraine, ²Department of Analytical Chemistry, Ivan Franko National University of Lviv, 6, Kyryla & Mefodya St., 79005, Lviv, Ukraine; kiose79@mail.ru

For the first time, Ukrainian natural bentonites are used as supports for anchoring Pd(II) and Cu(II) complexes. Depending on the bentonite origin, such supported metal complexes have different catalytic properties in the reaction of carbon monoxide oxidation. Bentonites, similarly to other natural sorbents, are selective with respect to metal ions: the bentonite origin affects Cu(II) position in the selectivity orders. However, there are no data concerning adsorption of Pd(II) and also Cu(II) and Pd(II) when they are simultaneously present in aqueous solution used for bentonite impregnation. Ukrainian bentonites under study were provided from Gorbske (Transcarpathian) and Dashukovske (Cherkasy region) deposits and were denoted as N-Bent(G) and N-Bent(D), respectively. They were characterized by XRD, IR and UV-Vis reflectance spectroscopy, and pH-metry. Cu(II) adsorption with both bentonites was carried out from individual Cu(NO₃)₂ and mixed Pd(II)-Cu(II) solutions ($C_{Pd(II)} = 2.8 \cdot 10^{-4}$ mol/L) (Figure).



Isotherms of Cu(II) adsorption with N-Bent(G) (a) and N-Bent(D) (b) samples from aqueous individual Cu(II) (1) and mixed Pd(II)-Cu(II) (2) solutions ($C_{Pd(II)} = 2.8 \cdot 10^{-4}$ mol/L)

It can be deduced that the type of adsorption isotherms depends on the bentonite origin: they are L type for N-Bent(G), whereas in the case of N-Bent(D), the L type adsorption isotherm is observed for the individual Cu(II) solution and, for adsorption from the mixed Pd(II)-Cu(II) solution, the H type isotherm takes place. More complicated isotherms of Pd(II) adsorption from individual Pd(II) and mixed Pd(II)-Cu(II) solutions with Cu(II) content of $3.0 \cdot 10^{-4}$ mol/L also were obtained (not shown here). The adsorption of each metal ion decreases in the presence of the second one being evidence of both competitive adsorption and inhomogeneity of adsorption sites. These conclusions were confirmed by estimation of constants K_L , of Langmuir equation.

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