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SELECTIVE EXTRACTION OF CATIONS Ag^+ , Au^{3+} , Cu^{2+} FROM AQUEOUS SOLUTIONS THE SURFACE OF THE COMPOSITE Fe_3O_4/SiO_2

The aim of this work is the study of selective extraction of cations Ag^+ , Au^{3+} , Cu^{2+} from aqueous solutions the surface of the composite based on Fe_3O_4/SiO_2

In the course of the study for creating a favorable pH environment used acetate-ammonium buffer solutions[1]. Adsorption capacity (A, mg/g), the distribution rate (E, ml/g) and the degree of extraction (R,%) were determined by usage of atomic absorption method [2].

In the study of selective extraction of the cation Ag^+ paired with Cu^{2+} at pH=6 it was found that the concentrations of the second cation does not affect the adsorption in aqueous solutions the surface of the composite Fe_3O_4/SiO_2 (Table.1).

Table 1

Adsorption of Ag^+ in the joint presence of Cu^{2+} surface of Fe_3O_4/SiO_2

$C_o, Ag^+ mg/l$	$C_{Ag^+} : C_{Cu^{2+}}$	A,mg/g	E,ml/g	R%	pH
1,55	1:0	0,219	892	84,26	6
1,67	1:0,05	0,233	835	83,37	6
1,73	1:0,3	0,245	916	84,62	6
1,57	1:1	0,221	901	84,39	6
1,91	1:2,5	0,267	858	83,74	6

The degree of extraction of Cu^{2+} ions companied by the concentration of ions Ag^+ decreases and exerts a competitive influence (pH = 8). However, when the concentration of ions Au^{3+} extraction degree of Cu^{2+} ions increases, it indicates the joint adsorption of the studied cations(pH = 8,5) (Table. 2).

Table 2

Adsorption of Cu^{2+} in the joint presence of Ag^+ , Au^{3+} surface of Fe_3O_4/SiO_2

$C_o, Cu^{2+} mg/l$	$C_{Cu^{2+}} : C_{Ag^+}$	A,mg/g	E,ml/g	R%	pH
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5,48	1:0	0,47	181	52,06	8
5,45	1:0,02	0,39	142	46,04	8
5,27	1:0,1	0,39	135	44,77	8
5,39	1:0,2	0,34	108	39,35	8
5,81	1:1	0,38	106	38,79	8
C₀, Cu²⁺,mg/l	C_{Cu²⁺}: C_{Au³⁺}	A,mg/g	E,ml/g	R%	pH
5,040	1:0	0,63	487	74,50	8,5
4,984	1:0,02	0,64	577	77,59	8,5
4,871	1:0,1	0,70	1052	86,33	8,5
5,363	1:0,2	0,74	800	82,75	8,5
5,374	1:0,5	0,71	647	79,51	8,5

Analyzed the data shows that with increasing concentration of Cu²⁺ ions the degree of extraction of ions of Au³⁺ increases. This proves the joint adsorption of cations in aqueous solution at pH = 8.5 on the surfaces of composites of Fe₃O₄/SiO₂.

Table 3

Adsorption of Au³⁺ in the joint presence of Cu²⁺ surface of Fe₃O₄/ SiO₂

C₀, Au³⁺, mg/l	C_{Au³⁺}: C_{Cu²⁺}	A,mg/g	E,ml/g	R%	pH
5,046	1:0	0,458	199	54,46	8,5
5,788	1:0,02	0,563	233	58,33	8,5
5,758	1:0,1	0,904	2681	94,15	8,5
6,140	1:0,2	0,851	822	83,14	8,5
6,075	1:0,5	0,631	276	62,35	8,5

LITERATURE

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