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**THE COMPARATIVE CHARACTERISTICS OF ADSORPTION  
PROPERTIES OF COMPOSITES OF Fe<sub>3</sub>O<sub>4</sub>, Fe<sub>3</sub>O<sub>4</sub> / SiO<sub>2</sub> (ChM), Fe<sub>3</sub>O<sub>4</sub> /  
SiO<sub>2</sub> (AM), Fe<sub>3</sub>O<sub>4</sub> / TiO<sub>2</sub> (ChM), Fe<sub>3</sub>O<sub>4</sub> / TiO<sub>2</sub> (AM) AND Fe<sub>3</sub>O<sub>4</sub> / Al<sub>2</sub>O<sub>3</sub> AS  
TO CATIONS La<sup>3+</sup> AND Y<sup>3+</sup>**

The issue of effective, cheap and available materials that would be characterized by high rates of organic and inorganic substances extraction from solutions of different nature including cations of rare earth metals remains topical today. The question of impact of these elements on living organisms arises logically. It is known that rare earth metals are often included as an impurity of the most important for minerals – phosphates and apatites [2]. Adsorption methods are of great importance for solving these tasks [3].

The aim of our research is to study the adsorption properties of magnetosensitive nanocomposites based on highly dispersive Fe<sub>3</sub>O<sub>4</sub>, modified SiO<sub>2</sub>, TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> as to cations La<sup>3+</sup> and Y<sup>3+</sup>.

Advanced nanotechnologies require highly purity substances. To extract such substances is possible by means of adsorption, to evolve certain substances in their particles of mixture.

Current researches in chemistry and physics show great prospects of magnetic nanomaterials application. One of the applications of magnetic composites is obtaining adsorption barriers for cations of metals. The advantage of such adsorbents, unlike non-magnetic, is that due to high sorption capacity available, they can control magnetic field. Their use greatly simplifies the general adsorption process because the phase of separation of the spent sorbent can be replaced by magnetic separation. Among the minerals that provide magnetic properties to synthesized materials, an important place belongs to magnetite.

We investigated the adsorption activity of nanocomposites Fe<sub>3</sub>O<sub>4</sub>, Fe<sub>3</sub>O<sub>4</sub> / SiO<sub>2</sub> (ChM), Fe<sub>3</sub>O<sub>4</sub> / SiO<sub>2</sub> (AM), Fe<sub>3</sub>O<sub>4</sub> / TiO<sub>2</sub> (ChM), Fe<sub>3</sub>O<sub>4</sub> / TiO<sub>2</sub> (AM) and Fe<sub>3</sub>O<sub>4</sub> / Al<sub>2</sub>O<sub>3</sub> as to cations La<sup>3+</sup> and Y<sup>3+</sup> from aqueous solutions.

As the result isotherm equilibrium sorption of La<sup>3+</sup> and Y<sup>3+</sup> on these surfaces was obtained. The processes of kinetics and pH dependence were investigated.

High adsorption activity of unmodified surfaces of magnetite Fe<sub>3</sub>O<sub>4</sub> / TiO<sub>2</sub> (AM) as to La<sup>3+</sup> and Y<sup>3+</sup> was available.

The processes of desorption of cations from aqueous solutions and 0.1n solution of HCl were investigated.

It is found out that the acidity of the solutions increases desorption of cations mentioned.

#### **LITERATURE**

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