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**ADSORPTION PARAMETERS OF NATURAL SORBENTS**

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**Introduction.** Usage as a sorbent of natural clay minerals and biological products for the purification of drinking water, process and wastewater, as well as the long-term use as biological indicators effective for the sensitivity of ecological purity of atmospheric air, lithosphere and hydrosphere. The lack of natural clay minerals is due to their low sorption volume and on this basis to develop and explore this problem.

**Aim:** The main purpose of the work is to determine the laws of the adsorption process, exploring the sorption properties of clay by absorbing calcium and magnesium cations.

**Materials and Methods:** The composition of calcium and magnesium cations is determined by the titrimetric method. The concentration of calcium cations in the flask and diatomite is about two times higher than the concentration of magnesium cations. Even with a small amount of  $E_a$  adsorption at  $0^\circ\text{C}$ , when the volume increases, the adsorption capacity begins at very high temperatures, i.e. describes the critical particle size of  $E_a$  and the ratio of access to microspores. The internal crystallographic grids of  $\text{Si}^{4+}$  are replaced by three discharges of  $\text{Al}^{3+}$  and the internal crystallographic grids of  $\text{Al}^{3+}$  are replaced by  $\text{Me}^{2+}$  or  $\text{Mg}^{2+}$ . This leads to the appearance of a possible negative charge. Usually this process is carried out by exchange cations. The energy of interaction of such cations depends on their charge, size, and location. Depending on the properties of the  $\text{Al}^{3+}$  or  $\text{Mg}^{2+}$  and O-H groups, it can be compared with the properties of the group on the surface of hydrated  $\text{Al}_2\text{O}_3$  or  $\text{MgO}$  oxides. The isoelectric point of  $\alpha$ - $\text{Al}_2\text{O}_3$  has  $\text{pH} \sim 9,2$ , closer to  $\text{MgO}$ - $\text{pH} 12,5$ . Consequently, these  $\text{pH} > 12,5$  or  $> 9,2$ , these oxides as acids, are based on  $\text{pH}$  as the following measurements. In other words, it participates in cationic, anionic exchange, in the side surfaces of  $\text{Al}^{3+}$  or  $\text{Mg}^{2+}$  crystals in acids, neutral and weakly alkaline media. They are replaced by  $\text{F}^-$ ,  $\text{H}_2\text{PO}_4^-$ . Proton points of hydroxyl groups that are associated only with cations  $\text{pH} > \text{pH}_{\text{isoe}}$  nucleoside layers fall into cation exchange. Sorption is characterized by the Langmuir isotherm,  $g = 0.034 \text{ mmol/g}$ , the radius of the sorption cations  $\text{SR} (\text{II})$  is  $0.3 \text{ nm}$ , the surface area is  $28.6 \cdot 10^{-20} \text{ m}^2$  (according to Stokes  $g_{\text{eff}} - 0.31 \text{ nm}$ ).  $\text{Cuds. equal} = 294 \text{ l/mol}$ ,  $\Delta G_{298}^0 = -5,7 \text{ kJ/mol}$ .

**Results and their discussion:** To determine the maximum adsorption ( $G_{\text{max}}$ ), the dependency table is set:  $1/G = f(1/C)$  and determines the value of  $G_{\text{max}}$ , which corresponds to the complete saturation of the upper layer. When the contact time of the solution and the sorbent increases, the properties of the isotherm do not change from a fraction of  $0.25$ - $1 \text{ mm}$  fraction to a fraction of  $1$ - $2 \text{ mm}$  fraction. In most cases, the fraction is carried out according to the degree of purification of the solution and the adsorption of the cation of magnesium, calcium ( $1$ - $2 \text{ mm}$ ). For solutions with low concentrations, the degree of solution purification from  $\text{Mg}^{2+}$  and  $\text{Ca}^{2+}$  ions increased by about  $10\%$ , and for solutions with high concentrations, by  $3$ - $5\%$ . Therefore, it makes no sense to increase the contact time of the solution and sorbent. The constants of the Freundlich equation are determined by the dependence  $\lg G - \lg C_{\text{equal}}$ . To determine the highest adsorption, graphs were plotted in coordinate's  $1/G - 1/C$ , the maximum value of adsorption, corresponding to the total surface saturation, is determined.

**Conclusions:** For the sorption of natural sorbents, oxidizing agents and filtration using modification based on many of the methods used were used. As a result, the  $\text{pH}$  in the solutions increased. The used natural sorbent is not pre-modified. It is also possible to clean solutions from  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$  cations without adding oxidizing agents and changing properties.