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KINETICS OF SORPTION ZN(II) BY BENTONITES

The problem of water pollution by heavy metals is actual nowadays, first of all, by appearing new manufactures and improving existing ones.

There is a huge amount of water treatment methods, but the simplest and most effective are adsorption. The advantages of these methods are high efficiency, the ability to clean sewage containing a mixture of substances, as well as the recovery of these substances. The effectiveness of adsorption purification reaches 80–95 % and depends on the chemical nature of the adsorbent, the size of the adsorption surface and its availability, on the chemical structure of matter and the chemical form of its location in the medium [1].

As sorbents, activated carbon, synthetic sorbents and some waste products (ash, slag, pitch, sawdust), mineral sorbents – clays (bentonites, saponites, etc.), silica gels, alumina gels and metal hydroxides are used.

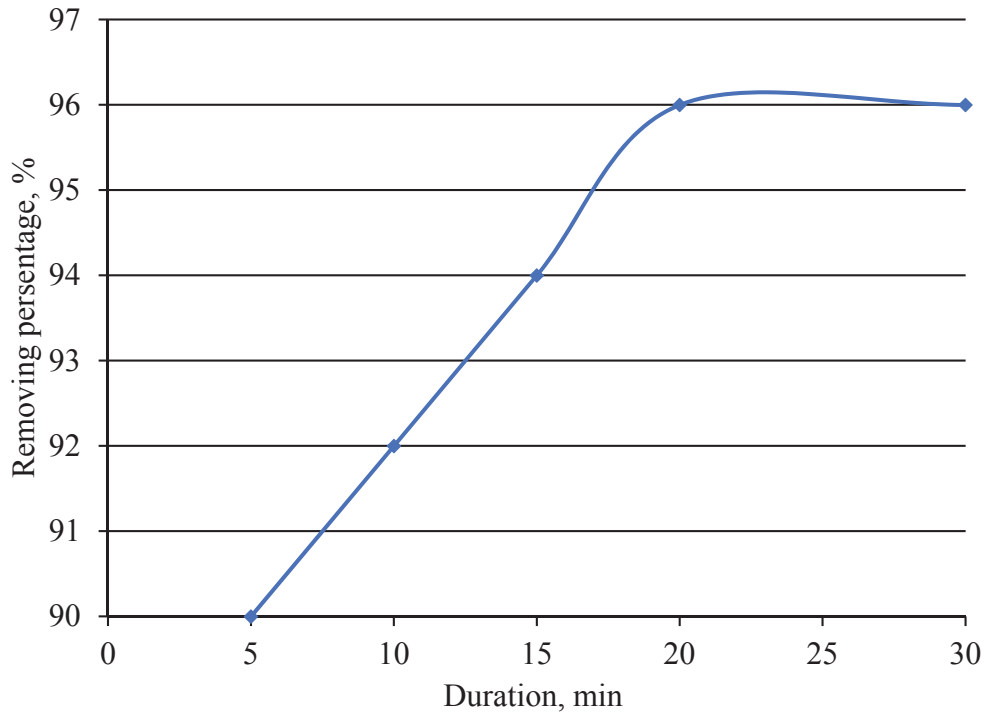

Figure – Kinetic curve of Zn(II) ions removal by bentonite clays

Usually in water treatment, coal or synthetic sorbents are used. However, they have a number of disadvantages associated with the ineffectiveness of regeneration of sorbents. These are sorbents or disposable, or those that are difficult to utilize, which is economically inappropriate. In this case, they are often toxic. Therefore, it is promising to use natural sorbents in water preparation. At the moment, there is a large number of natural sorbents – silica gel, alumogel, shungite, zeolites, vermiculite, agricultural waste [2].

To construct kinetic curves in 5 conical flasks, weighing bentonite weighing 1 g was added. Each of the flasks was poured into 100 cubic centimeter of solutions of Zn (II) at a concentration of 100 mg/dm^3. The flasks were sealed and placed on shaking over different time intervals, min: 5, 10, 15, 20, 30. The experiments were performed without adjusting the pH.

Figure shows kinetic curve of Zn(II) ions removal by bentonite clays.

According to the data of figure, with the increase of the dose of the sorbent, the effectiveness of sorption extraction of Zn(II) also increases, reaching a maximum value of 96% at a dose of bentonite 1 g/100 ml of solution. The further increase in the dose of bentonite is inappropriate and irrational.

References

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