

Removing of Useful Components from Deep Waters of the Sea with Natural and Synthetic Zeolites

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When there is next energy crisis in the world ecologically pure and inexhaustible energy sources are intensively discussed. One of the included part of solving of this ecological problem is energetic of ecologically pure hydrogen and its prospects in light of modern technological progress.

As it is well known, the Black Sea water contains a large amount of hydrogen sulfide (4.6 billion tons), and their quantity is increased every year due to pollution. Therefore one of the most important tasks of modernity is to solve serious ecological problem in the Black Sea but hydrogen sulfide may become as energy source. In this regard, it is important to making pure hydrogen from mentioned material via economically available technologies and makes more research for adapting to the concrete industry.

In the work carried out in 2012 year have been selected zeolites (both natural and synthetic), which will help us to remove useful components from deep waters of the Black Sea such as (H_2S , K^+ , NH_4^+) and separate them in order to eliminate major obstacle factors of hydrogen sulfide adsorption and their sending in pure form to a fuel cell. For implementation of above mentioned purpose at first the water moves in the adsorption column, which contains different types of zeolites. It is also important to remove the components in order to use them in agricultural sector (as a source of mineral fertilizer).

Based on experimental results it was established that between used zeolites the most volumetric capacity towards the ammonium ions has: modified zeolites of Khekordzula (3.1 mg/g) with HNaX and Khekordzula zeolites modified with Ni (3.06 mg/g), and potassium ions in a HNaX - by Khekordzula modified zeolites - 28.8 mg/g.

It has been determined the dependence of number of adsorbed ammonium ions and potassium ions on contact time with sorbent. As the presented data shows, after 30 min of contact numbers of adsorbed potassium ions does not change, but adsorption time for ammonium ions are 65 minutes in order to achieve the quality 91.1% - of the cleaning.