WATER PURIFICATION BY ACTIVATED BENTONITE CLAY

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Abstract

The water purification as the one of the most important ecological problem needs new effective techniques and materials. Previous investigations had shown good perspectives of different clays uses in target area. Group of scientist from Kyiv, Ukraine developed quite good and cheap method of bentonite clay modification for increasing of its surface area and its modification. Here sanitary bacteriological and chemical investigations of water purification by modified benonite results are reported.

The research task was to examine the possibility of natural water purification from different types of pollutants by modified clay. For that purpose water probes for investigations were taken from 3 different lakes in Kyiv into sterilized bottles without contact with air. Water temperature was 0-1°C. For investigations of metal removal additional pollutants were added. After interaction with bentonite dispersion during 10 minutes water was filtrated and examined on sanitary bacteriological parameters and different cations contents.

It was found that even after quite short interaction bentonite remove up to 100% of iron, copper and in two cases from 3 – zinc. Also, during purification concentration of nickel, cobalt and manganese decreases on 40-50% so it is expected that after longer interaction or uses of few-steps purification systems the 3d-metals could be fully removed from the water.

One more result of interaction of water with modified bentonite was found is downturn of water hardness on 10-40%, so during purification process removing of cationic-type pollutants did not cause losing of water drinking properties due to hardness exceeding.

Sanitary bacteriological investigations shown that water interaction with modified bentonite provide to reducing of total bacterial amount. Unfortunately clay did not shown very high efficiency against Enterococci so for full water purification additional reagents could be added.

Keywords

Water purification, Bentonite, Heavy metals removal