

Changes in the concentration of aluminum in water after the treatment process - experience from technological research

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ABSTRACT

Technological research was carried out to determine an effective treatment technology for surface water characterized by low alkalinity, high-temperature volatility and an occasionally high content of organic substance. Three large technical installations operating in parallel were analyzed: coagulation with sludge flotation, micro-sand ballasted coagulation with sedimentation, coagulation with sedimentation and sludge recirculation. The capacity of the installations ranged from 10 to 40 m³/h. The critical treatment process for the analyzed water was coagulation in an acidic environment ($6.5 < \text{pH} < 7.0$) carried out in a system with rapid mixing, a flocculation chamber, preliminary separation of coagulation products and removal of residual suspended solids through filtration. The effectiveness of the treatment technology was assessed based on such parameters as the content of the organic substance and the iron and aluminum concentrations. The purpose of the research was to select the primary treatment technology for the surface water to be used ultimately in the energy sector. In addition to organic compounds, aluminum also turned out to be a critical parameter for deciding about the effectiveness of the primary water treatment. Therefore, particular attention was paid to this parameter - it was controlled in connection with other relevant technological indicators.

Keywords: Aluminum; Full scale technological investigation; Water treatment; Coagulation; Filtration

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