

Mineralization of oxalic acid by ozone in the presence of activated carbon particles

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Abstract

The results of the study of the influence of activated carbons (BAU-A and AG-5) with different textural characteristics on the rate of oxalic acid mineralization during ozonation are presented. It was found that in the presence of activated carbons studied mineralization rate of oxalic acid significantly increased. Despite the substantial difference in textural characteristics of the activated carbons studied, the catalytic activity of the sample BAU-A is only slightly lower compared to sample AG-5. Theoretical analysis of the macrokinetic regimes of oxalic acid mineralization during ozonation in the presence of activated carbon particles was carried out. The effect of activated carbon particles size on the degradation rate of oxalic acid was studied. The concentration of the active sites (OH-groups) on the surface of the studied samples of activated carbon using FT-IR spectroscopy was estimated. It was found that the concentration of active sites (OH-groups) on sample BAU-A only slightly lower comparing with the sample AG-5. This was in agreement with the data on the catalytic activity of these samples. It was shown that the rate of oxalic acid mineralization during ozonation significantly increased with decreasing activated carbon particles size. It was concluded that catalytic mineralization of oxalic acid by ozone was realized in external kinetic mode, when macroscopic velocity of the process depended on the catalyst particles size and concentration of active sites on its surface and is nearly independent of its textural characteristics.