The impact of humic acid on the removal of bisphenol A by adsorption and ozonation

Bo-Ra Lim, Si-Hyun Do, Seong-Ho Hong*

Department of Chemical Engineering, Soongsil University, Seoul 156-743, Republic of Korea, Tel. +82 2 820 0628; Fax: +82 2 812 5378; email: shong@ssu.ac.kr

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ABSTRACT

This study investigates the removal of bisphenol A (BPA) by either adsorption or oxidation when humic acid was presented. For adsorption, three types of activated carbon (A, B, and C) were used. BPA adsorption with the presence of humic acid (4.5 mg L\(^{-1}\)) showed that Freundlich constant (\(K\)) was reduced in the range of 31–68%, compared to \(K\) without humic acid. Moreover, the relatively greater influence of humic acid on BPA adsorption was observed when activated carbon with the larger portion of micropore (i.e. activated carbon B) was used. BPA oxidation was tested using ozone solutions (0.5–4 mg L\(^{-1}\)). The presence of humic acid (5 mg L\(^{-1}\)) reduced BPA oxidation in the range of 16–26%. The presence of bicarbonate increased BPA oxidation, but no significant influence of bicarbonate concentration (from 46 to 180 mg L\(^{-1}\)) was observed. The increasing pH increased BPA oxidation, and BPA (7 mg L\(^{-1}\)) was completely removed when 4 mg L\(^{-1}\) of ozone solution was used at the pH of 4–10. In addition, the appearance of degradation by-products depended on both concentration of ozone solution and the pH.

Keywords: Bisphenol A; Humic acid; Activated carbon; Ozone solution; The pH

*Corresponding author.

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