

Removal of geosmin and 2-MIB using photo-Fenton oxidation

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Abstract

Geosmin (GSM) and 2-methylisoborneol (MIB) are most popular and problematic earthy-musty compounds in drinking water when heavy cyanobacterial blooms occur. The removal of them is difficult in conventional drinking water treatment that photo-Fenton oxidation have been evaluated for the removal of GSM and MIB. The photo-Fenton oxidation was conducted at the concentration of Fe(II) (0.5-20 mg/L) and H₂O₂ (1-20 mg/L), respectively, in UV-C reactor. The highest removal rates were 48.4% (GSM), and 84.3% (MIB), respectively, at the UV dose of below 3,500 mJ/cm². MIB was removed most (95.5%) at pH 3 within 15 min. Geosmin and 2-methylisoborneol can be successfully removed below the guideline level in South Korea (20 ng/L) under UV dose = 1,500 – 3,500 mJ/cm² using photo-Fenton oxidation when the initial GSM and MIB concentration under 50 ng/L. The photo-Fenton oxidation was good candidate for removal of GSM and MIB.

Acknowledgments

This work was supported by the National Research Foundation of Korea (NRF) Grants funded by the Korea government (MEST) and the National Research Foundation of Korea Grant funded by the Korean Government (MSIP) (NRF-2014M3C8A4034282 and 2016 University-Institute cooperation program).