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## Application of a ceramic membrane contacting process for ozone and peroxone treatment of micropollutant contaminated surface water

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### Highlights

- Hydrophobized ceramic membranes were applied for the transfer of ozone to water.
- Ozone and peroxone treatment of four typical micropollutants was examined.
- Processes efficiency was greatly influenced by membrane contactors inner diameter.
- Ozone gas concentration was a crucial parameter for bromate formation.

### Abstract

This study investigates the performance of membrane-based ozonation or peroxone processes, regarding the transformation of carbamazepine (CBZ), benzotriazole (BZT), p-chlorobenzoic acid (pCBA) and atrazine (ATZ) in natural surface waters, as well as the formation of bromates. Ozonation performed with the use of ceramic membrane contactor was able to diminish CBZ concentration below 0.1  $\mu\text{M}$  at 0.4 mg  $\text{O}_3/\text{mg DOC}$ , i.e. presenting >90% removal rate, whereas the transformation of BZT, pCBA and ATZ was not exceeded 70%, 57% and 49%, respectively, under the same experimental conditions. The addition of  $\text{H}_2\text{O}_2$  reduced the removal efficiency of CBZ, since up to -8% transformation values were observed at 0.1 mg  $\text{O}_3/\text{mg DOC}$ . In

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