Advanced Oxidation Processes (AOPs)

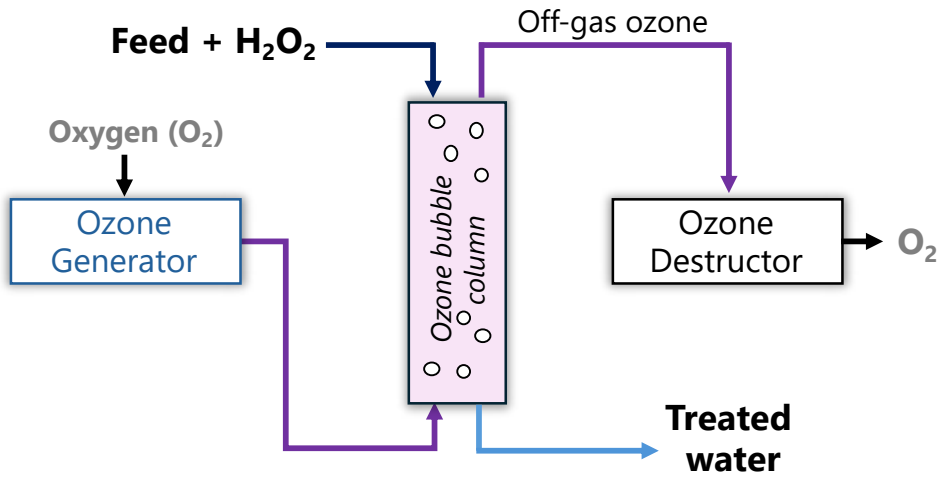
Process Description

AOPs are chemical treatment technologies that generate highly reactive hydroxyl radicals (•OH) in situ to oxidize and degrade organic contaminants, including microorganisms, in water and wastewater.

Hydroxyl radicals are produced through combinations of oxidants and energy sources, such as ozone (O_3), hydrogen peroxide (H_2O_2), ultraviolet (UV) irradiation, and photocatalysts. Common AOP configurations include Fenton oxidation (iron/H_2O_2), O_3/H_2O_2, UV/O_3, UV/H_2O_2, UV/H_2O_2/O_3, and photocatalytic oxidation. A combination of these AOP methods can also be implemented.

AOPs are applied for treating refractory and non-biodegradable contaminants, including aromatic compounds, field chemicals (e.g., kinetic hydrate inhibitors, etc.), and other trace organic pollutants. They are typically applied as a polishing and/or disinfection step following conventional treatment, with solids separation and ozone destruction incorporated, as needed, prior to water reuse or discharge.

Process Schematic



Publications

- Screening of advanced produced water technologies: overview and testing results (Link)
- Determination of field chemicals: corrosion inhibitor (CI) and kinetic hydrate inhibitor (KHI) in produced water (Link)

Patent

Advanced oxidation of kinetic hydrate inhibitors (Link)

For further information, please contact us at email: GWSC@conocophillips.com