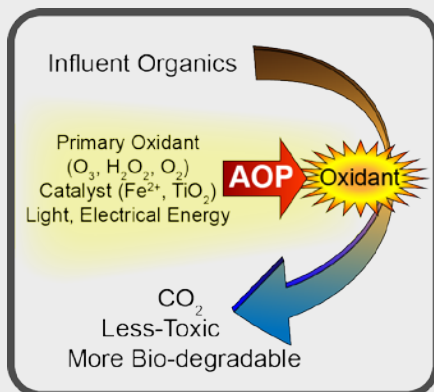


## Advanced Oxidation Processes (AOPs)

involve the generation of a reactive oxidant (usually hydroxyl radicals), capable of inducing oxidation of organic contaminants. The strong oxidant is produced using one or more primary oxidants ( $O_3$ ,  $H_2O_2$ ) and/or energy source (UV light) and/or catalysts ( $TiO_2$ ,  $Fe^{2+}$ ).



## More information

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# Advanced Oxidation Processes

UNSW Water Research Centre, School of Civil and Environmental Engineering

## Competitive advantage

- Can achieve oxidation of non-biodegradable and toxic organics such as aromatics, pesticides, volatile organic compounds;
- Complete mineralization of organics can be achieved;
- Relatively clean technology with no significant amount of waste generated;
- Destruction of organics rather than just transfer from liquid to solid phase can be achieved;
- Enhanced biodegradability of residual organics after AOPs can improve efficiency of biological treatment.

## Recent research projects

- Mechanistic understanding and application of Fenton, heterogeneous Fenton, fluidized bed Fenton, photo-Fenton processes;
- Understanding and application of ozonation, ozone/ $H_2O_2$  and catalytic ozonation process for removal of organics in domestic and industrial wastewaters;
- Activated persulfate processes for removal of organics;
- Oxidation of organics via formation of high-valent iron and copper species using tetraamido macrocyclic ligands.

## Successful applications

- Treatment of nanofiltration concentrate using AOPs;
- Use of catalytic ozonation for treatment of industrial wastewater.

## Facilities and infrastructure

- UNSW Water Research Centre has extensive research resources and facilities including Light sources, Ozone generator, Scintillation counter (for probing  $C^{14}$  labelled organic compounds), UV-Vis and Fluorescence spectrometers, respirometric apparatus, HPLC and LC-MS for implementation of high-quality research on AOPs for treatment of wastewaters;
- Access to and experience with advanced chemical kinetics simulation software and computational fluid dynamics software for deduction and optimization of process conditions and reactor design.

## Our experts

- **Professor David Waite, NAE**  
Executive Director/CEO, CTET

