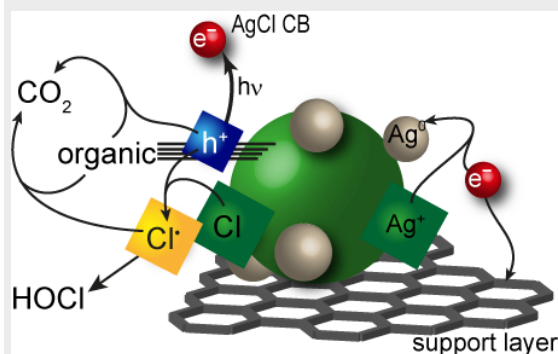


Silver/silver halide based photocatalysts generate reactive oxidant such as chlorine and/or carbonate radical with these species capable of inducing oxidation of organic contaminants on irradiation by visible light.



Silver nanoparticles based water treatment technologies

UNSW Water Research Centre, School of Civil and Environmental Engineering

Competitive advantage

- Silver nanoparticles are effective antimicrobial agents and demonstrate long term efficacy
- Low cost ceramic water filters impregnated with silver nanoparticles simultaneously achieve disinfection as well as removal of organics and heavy metal by adsorption
- Silver halides have low band gap and can be activated using visible light.
- Ag-Ag halide composites can utilize solar energy for oxidation of organic contaminants
- Relatively clean technology with no significant amount of waste generated during synthesis or operation

Recent research projects

- Silver nanoparticle – reactive oxygen species interaction
- Oxidative dissolution of silver nanoparticles by chlorine
- Optimizing the design and synthesis of supported silver nanoparticles for low cost water disinfection
- Mechanistic insights into reactive oxygen species generation and contaminant degradation by unsupported and supported silver halides

Successful applications

- Reactive oxygen species generation by zerovalent silver nanoparticles: implications to toxicity and contaminant degradation
- Interaction between silver(I), silver nanoparticles and reactive oxygen species: implication to bactericidal behaviour and contaminant degradation

Facilities and infrastructure

- UNSW Water Research Centre has extensive research resources and facilities including light sources, scintillation counter (for probing C14 labelled organic compounds), UV-Vis and fluorescence spectrometers, HPLC and LC-MS for implementation of high-quality research on treatment of potable waters
- Access to and experience with advanced chemical kinetics simulation software to model the reaction kinetics and predict dissolved Ag(I) and reactive oxygen species concentrations (and hence associated toxicity) under various operating conditions

More information

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