



Halogen Removal for Ultrapure Water

Auburn University is seeking a licensee or development partner for a polymer that removes chlorine, bromine and chloramines from water to ultrapure levels.

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Reference: Chlorine Removal

Overview: Certain water applications require ultrapurity with respect to halogen compounds such as free chlorine, free bromine, and chloramines. Examples include:

- Dialysis water, where excess halogen can cause hemolytic anemia;
- Applications, including dialysis, where chlorine can damage reverse osmosis membranes;
- Point of use drinking water or bottled water, where excess halogen can be problematic for people sensitive or allergic to such compounds.

This technology utilizes polymer beads to quickly remove halogens from water.

Advantages:

- **FAST** - Removal to ultralow levels with contact times of a few seconds
- **SAFE** - As halogen is bonded, protection against biofouling occurs, unlike activated charcoal
- **RENEWABLE** - Cartridges could be returned by customers for recharging and resale

Description: N-halamine compounds are well established antimicrobial agents. They hold a halogen atom and make it available for release upon contact with a pathogen. Auburn University has recently demonstrated that un-halogenated N-halamine polymers efficiently remove free halogen from water. By packaging these beads in a column, water can be run through to remove halogen in a matter of seconds. Removal of chlorine to levels below 0.05 ppm has been demonstrated — well below the standard for dialysis water of less than 0.1 ppm. Interaction of these polymers with bromine and chloramines is well established. This creates an opportunity for low cost, high speed removal of halogens to create ultrapure water for high demand applications such as dialysis.

Current methods to achieving ultrapure water include activated charcoal, which is prone to fouling. With the Auburn technology, once the beads have removed halogen from the water, they become antimicrobial, which will deter fouling. Further, the beads can be reused with a simple chemical treatment. This enables a business model where customers return used cartridges to receive replacements.

Status:

- Subject of US patent application [20220193633](#)
- This technology is available for exclusive or non-exclusive licensing
- This technology has been shown to lower free chlorine concentrations from 1 ppm to less than 0.05 ppm using contact times of less than three seconds
- Further work planned to optimize the technology



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