Docket #: S19-388

Efficient Electrochemical Advanced Oxidation Process for Water Treatment

Stanford researchers have developed an efficient electrochemical pathway for hydroxyl radicals (*OH) production for advanced treatment trains for purification of municipal wastewater for potable reuse. Current method of OH production uses UV light splitting of H_2O_2 which is less efficient due to the low absorption coefficient of H_2O_2 and only about 10% use of H_2O_2. This new electrochemical advanced oxidation process (AOP) requires lower H_2O_2, uses the H_2O_2 more efficiently and can avoid the use of expensive electrode materials. Demonstration of electrochemical dissociation of H_2O_2 has been demonstrated with a low-cost stainless steel electrode.

Stage of Development

- Lab scale demonstration

Applications

- Broadly applicable to **water treatment**
- Purification of municipal wastewater for potable reuse
- Can be scaled down to treat wells (e.g. wastewater recycling at the building scale)

Advantages

- **More efficient** electrochemical method as compared to current UV light splitting method

- **More simple and streamlined approach** to post-reverse osmosis (RO) disinfection, especially needed in municipal waste water recycling
- **More complete use** of H_2O_2, and less concentration of H_2O_2 needed
- **Lower energy consumption** using an electrochemical approach instead of UV light splitting
- **Modular approach** – can be scaled up or down
- **Works with smaller-scale devices** (e.g. wastewater recycling at the building scale)
- **Avoids the use of expensive electrode materials that have low stability** (e.g. boron-doped diamond, rare earth metals)

Patents

- Published Application: 20210078876

Innovators

- William Mitch

Licensing Contact

Luis Mejia

Senior Licensing Manager, Physical Sciences

Email