Sustainable Solutions: Comparing Electrochemical vs. Traditional Methods of Wastewater Remediation

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2 billion people lack access to safe, clean drinking water in their homes. Of those, 8 out of 10 lacking basic drinking water services live in remote or rural areas without coordinated water treatment and delivery systems. Traditional methods of wastewater remediation are not seen as viable for remote areas due to the constant need to supply of Potassium aluminum sulfate (alum) and Calcium oxide (lime) for the coagulation/flocculation process. Can solar energy be used to create environmentally friendly and sustainable electrochemical methods for remediation of wastewater? I hypothesize that electrochemical reactions using solar energy will remediate wastewater as well as the traditional remediation process using Potassium aluminum sulfate (alum) and Calcium oxide (lime). Further, I hypothesized that the floc produced in the electrochemical reaction will contain less excess water resulting in less floc to discard of. Traditional water treatment plants use multi-step processes to remediate wastewater including use of Potassium aluminum sulfate and Calcium oxide. Electrocoagulation is a process that replaces the traditional methods of using lime and alum with electrical current being passed through a sacrificial anode. Both the traditional and the electrochemical methods of remediation produced statistically significant reductions in the turbidity of both the wastewater and the pond water samples. The final result is not drinking water quality – rather, the experiment was completed to conclude that electrochemical remediation could be a viable alternative to traditional methods of wastewater remediation. I can accept my hypothesis that the electrochemical methods of remediation reduced the turbidity as well as traditional methods.

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