Publications

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Electrophoretic Clarification of Water

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- Full Text

There is an ever growing need for new and superior water treatment methods which will remove the alarming growth and variety of pollutants present in our waters. Suspended particulate matter such as clay, algae, and bacteria are troublesome pollutants in almost all waters and particularly in surface water.

This research project was primarily an investigation into the direct use of electric currents and electric fields to bring about water clarification and purification. Electrophoretic and electrochemical systems appear well adapted for removal of these electrically charged pollutants and in addition have the potential of being entirely automated. Numerous design concepts are advanced and tested through the use of laboratory models. These include a parallel plate model which was designed entirely for electrophoretic removal, and porous filter and electrode grid models which incorporated both electrophoretic and electrochemical capabilities.

Successful water clarification was attained with the parallel plate model only when the influent water was of very low electrical conductivity. Electrolysis products at high conductivities caused sufficient turbulence to completely disrupt electrophoretic transport. In addition, primary and secondary chemical reactions took place due to electrolysis, which altered the characteristics of the suspension. It was also concluded that the ease of automation with an electrophoretic system does not justify the high cost of water treatment by this method.

Water purification by electrochemical means overcame this problem and was successful both operationally and economically. As a result of the experimental testing, an example design of a small semiautomated electrochemical water system is offered which incorporates electrochemical flocculation, settling and electrochemical disinfection operations.

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TWRI and the Texas A&M Institute of Renewable Natural Resources are working together to foster and communicate research and educational outreach programs focused on water and natural resources science and management issues in Texas and beyond.

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