# Using Solar Power in a Combined Electrocoagulation-Electroflotation Approach to Water Treatment

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Many people in rural, poverty-stricken areas of the globe lack reliable access to clean water and though treatment techniques exist, building the infrastructure required for a treatment plant is expensive. Electrocoagulation is one potential method, and it has been studied for years, but the costs of both electricity and high quality electrodes have prevented it from widespread use. The objective of this project was to address these issues in the development of a prototype for a low-cost household system that used electrocoagulation and solar power to pre-treat water in order to increase final water quality and maximize filter lifetime. Low-grade aluminum was selected as the preferable electrode to minimize costs and the system was designed based on standard chemical coagulation jar testers. Many trials were carried out with both a conventional battery and solar power to optimize parameters for maximum pollutant removal. Variables such as pH, aluminum dosage, flocculation time, and sedimentation time were isolated and optimized for water from natural sources. Various water quality measures were evaluated, showing 80% to 99% removal of all pollutants tested for. The results of the project suggest that a combined approach of electrocoagulation and electroflotation can effectively pretreat water in a way that decreases treatment cost while increasing water quality.

**Awards Won:**