REMOVAL OF MICROPLASTICS VIA ELECTROCOAGULATION PROCESS USING TITANIUM DIOXIDE ELECTRODE.

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By

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ABSTRACT

Microplastics are pervasive pollutants that could be detrimental to ecosystems. Microplastics are present in wastewater, which could cause the ecosystem to become even more contaminated. The aim of this study are to synthesis and characterize the anodized titanium dioxide as electrode in electrocoagulation process and to investigate the removal efficiency and kinetics study of titanium dioxide electrode for MPs removal via electrocoagulation process. In this work, modified Ti electrode was prepared using anodic oxidation of Ti foil in fluorinated ethylene glycol electrolyte. Anodization was done at 60 V at room temperature for 30 min anodization time to produce self-aligned titanium dioxide nanotubes (TNTs). The anodized TNTs were used as electrode to remove 200 ppm of 125 μm of polypropylene microplastics (MPs) using electrocoagulation (EC) method. After 90 min EC reaction time, 84.55% removal of MPs was achieved using anodized TNTs compared to pristine Ti foil as control (71.91%). The kinetic data were best fitted to pseudo-first-order kinetic model. The result showed that the modification of surface electrode by anodization can be applied to enhance the MPs removal using EC method. However, the understanding of MPs properties and evaluating the optimized anodization parameter can be further investigated to boost the MPs removal using TNTs as electrode via EC method.