

Technical Meeting on Emerging Applications of Plasma Science and Technology

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Removal of Dye Contaminates in Water by a Plasma Liquid Interface

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A promising approach for removing methylene blue (MB) in wastewater is the plasma liquid interface (PLI). Indeed, PLI can destroy contaminants at room temperature without adding chemicals due to PLI's ability to provide abundant environmental oxidation at the interface, including OH, O, H₂O₂, radicals, excited species, electrons, and ions. Herein, the removal of MB in water was investigated by PLI. The PLI was created by a cold plasma jet generated by a gliding arc plasma, and its plasma interacted with a solution, a concentration from 5 to 20 mg/L. The experimental results indicated that the MB in the solution was entirely removed under adequate time interaction by reactive LPI, which depended on initial MB concentration and experimental conditions such as stirring and injection of oxygen. After a reasonable time, interaction, the solution was examined by FTIR and GC-MS to identify intermediate compounds during PLI in order to suggest a PLI mechanism for MB removal. As a result, feasible reaction pathways for MB removal by PLI will be present, along with recommendations for future research advancements.

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