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Plasma-assisted Removal of Polymer Residues from Two-dimensional Materials

Two-dimensional (2D) materials stand out as promising candidates for electronic and sensor applications, owing to their exceptional characteristics including flexibility, transparency, high carrier mobility, and tuneable bandgap. Despite significant progress in 2D material growth, the use of incompatible substrates requires a transfer process, during which the material is contaminated by organic polymers.

Cleaning 2D layers poses a challenge due to potential quality compromise. Current methods struggle with film damage during the polymer removal process. Plasma etching emerges as an efficient, fast, and selective cleaning method.

This project focuses on optimizing plasma cleaning techniques for 2D materials (e.g., graphene, transition metal dichalcogenides). By exploring diverse chemistries and process conditions, I aim to enhance cleaning efficiency while preserving material integrity, contributing to the advancement of 2D material applications in electronics.

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