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Design, Characterization and Applications of Low-Energy Ion Source for Modifying Polymer Surface Properties

For this work, a cold cathode ion source with a Langmuir electric probe was constructed to produce an ion beam that could be successfully applied to a variety of applications. A steady discharge plasma media was produced by adjusting its operation conditions, such as the discharge voltages, electrode gap, as well as gas pressure. Additionally, the I-V plasma graph is recorded by inserting an electrical probe into the discharge plasma to identify plasma characteristics. The probe can be directed to any location inside the plasma region. To record the plasma parameters, including electron temperature and density, the gas pressure as well as probe-cathode spacing are changed. Moreover, the discharge characteristics will be fine-tuned and discussed by assessing the current discharges under the influence of gas pressure and cathode-probe distances. By subjecting the polymeric films to the extracted beams, the surface properties are altered. By increasing the irradiation period, the surface free energy is raised. This ion source is extremely effective and specifically designed to meet the demands of applications like polymeric surface modification.

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Yes

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