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Low-Voltage Extraction Characteristics of Ion Beams and Space Potential Measurements on ECRIS

Electron cyclotron resonance ion source (ECRIS) has been constructed for producing various ion beams (e.g. iron-endohedral fullerene) in Osaka Univ. We hope that it can become a universal source capable for producing ions with wide range of mass/charge ratio (m/q). Low-voltage extraction is required for ions with large m/q ratio and we investigated the beam characteristics at low extraction voltages. The space potential of the plasma in the ion source can be obtained by the relation of extraction voltage and magnetic field strength of the sector magnet. At the same time, the plasma space potentials were measured by using a Langmuir probe and compared with those obtained by the beam method. As a result, a correlation was found between their values obtained by the two methods. We will also describe the dependences on parameters such as ion species, gas pressures, and input microwave powers.

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