

Generation and Properties of Plasmas in Contact with Ionic Liquids

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Generation and Properties of Plasmas in Contact with Ionic Liquids RIKIZO HATAKEYAMA, KAZUHIKO BABA, TOSHIRO KANEKO, Department of Electronic Engineering, Tohoku University — Recently, much attention is paid to the plasmas in contact with liquids for potential applications in the material synthesis fields. We have focused on sheath electric fields in gas-liquid interfacial regions because the electric fields are effective for the control of ion behavior in both gaseous and liquid phases on the synthesis process. Here, ionic liquids are regarded as the liquids introduced into the plasma because of their greatly interesting characteristics such as their composition consisting of only positive and negative ions and extremely low vapor pressure. In this work, a plasma in contact with ionic liquids is generated in the range of low gas and atmospheric pressures. The plasma ion irradiation to ionic liquids is realized through the formation of the sheath electric field. As a result, the ion irradiation causes a remarkable change of the ionic liquid color and has effects on the plasma parameters in gas phase such as an increase in the electron density. The chemical and physical reactions induced by irradiating the plasma ion are expected to contribute to the novel material synthesis.

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