

25pA-1

September 25th (Fri.), <14:00-15:15>
Room 1

Charging methods to create uniform surface charge distributions with wide potential range

A. Ohsawa

JNIOISH

Abstract:

We have investigated corona charging methods using corona needle arrays or a corona triode for the creation of a uniform surface charge distributions with wide potential range on insulating films in contact with a grounded plate. Two types of corona needle arrays were used. In the triode charger, we sought optimum conditions of the separation between the grid and the film, the way of the electrical treatment of the grid, such as isolated, grounded with a resistor from 30 M Ω to 1000 M Ω , with voltage application and the corona discharge of 7 wires of 0.1 mm or 0.05 mm driving at constant voltage or current modes. Consequently, it was found that a triode charging system with corona wires of 0.05 mm in diameter and a grid electrode at a wanted surface potential with a grounded resistor can create the uniform charge distributions on the films

25pA-2

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Room 1

Numerical Simulation of Behavior of Tumor Cell in Three Dimensional Dielectrophoretic Device

KENTA Sato

Tokyo Metropolitan University

Abstract:

Effective separation and condensation processes are essential for precise detection of circulating tumor cells in early diagnosis of cancer. In this study, we proposed a dielectrophoretic device with micro pillar electrodes as cell separator. Also, we simulated the spatio-temporal behavior of model cells on the basis of microfluidics and electrokinetics. The particle trajectory in a flow direction was changed by negative dielectrophoretic force generated between the pillars. This result suggests the tumor cells can be purified from real blood under adequate electrical condition.

25pA-3

September 25th (Fri.), <14:00-15:15>
Room 1

Control of Dc Partial Discharge Development Creeping on Charged Insulating Film Surface in Air

Yoshiaki YAMANO

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Abstract:

The development of surface discharge on charged insulating film in air (one kind of ESD) was controlled by superimposing the normal component of electric field on the charged film surface. The film used was PET of 50 mm thick. The surface was charged up to ± 1 kV in maximum with corona discharges. The longest air gap between HV electrode tip of metal and the charged film surface was 1.5 mm. The results suggest that the control of discharge development on charged surface may be possible if the additional HV electrode is applied to increase the normal electric field component on the film surface.

25pA-4

September 25th (Fri.), <14:00-15:15>
Room 1

A new method for measuring electric field in air by a charged droplet

Takashi Sato

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Abstract:

A quadrupole electrode which is constituted with two pairs of wire electrodes was used. A charged droplet is held in the central area of the quadrupole electrode by a high frequency electric field. If an additional electric field is applied to this system, the charged droplet is affected by it and will move or vibrate by the external field. We tried to measure the electric field strength in air from the movement of the droplet by a D.C. electric field and the vibration amplitude by an A.C. electric field.

25pA-5

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Room 1

Effect of Corona Discharge on EHD Spray

Hyun-Ha KIM

AIST

Abstract:

The effect of corona discharge on the electrohydrodynamic (EHD) spray was studied for both polarities of negative and positive DC voltage. Various spray modes were visualized using a high-speed camera. The time-resolved images provided some information on the different elongation pattern according to the polarity. Typical onset streamers in air under positive polarity had minimal influence on the spray mode because they were found to be separated in time and space from the water meniscus. In contrast to the stable glow under positive polarity, many current pulses (Trichel pulse) were observed in the negative EHD spray. From the combined analysis of the corona discharges, one may conclude that the different properties of the coronas were associated with the spray patterns in both air and pure CO₂ environment.