

CHARACTERISTICS OF CHARGED SPRAYS OF INSULATING HYDROCARBON LIQUIDS

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ABSTRACT

This paper describes the characteristics of charged sprays of insulating liquids generated by charge injection electrostatic atomizers, assessed for a smaller range of orifice diameter and a more viscous liquid than previously investigated. The jet break-up dynamics are qualitatively studied with a high-speed video camera, and the general spray characteristics are quantitatively described in terms of droplet velocity and diameter pdfs with a phase Doppler anemometry (PDA). A purpose-built transmitter and receiver, and a purpose-built signal- processing counter are used as the main PDA component. Spray charge and mass flow rate as a function of spray radius is also studied using a purpose-built collecting system, and the results suggest that highly charged droplets exist outside the spray cone.

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