Preparation of uniform droplets by electrohydrodynamic atomization

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A series of experiments were conducted to generate uniform liquid (water) drops through the electrohydrodynamic atomization (EHDA) process. The water droplets made by EHDA have high net charge on the surface and their size can be controlled by varying either flow rate or the electrical conductivity of water. Because of these properties EHDA has been applied to ink-jet printing, and coating process. Here, we have used electrospray to create monodisperse emulsion droplets. The pattern of droplets generated at the capillary tip can be classified into several modes depending upon the electric field strength. Especially, the operation in cone-jet and field enhanced dripping mode is suitable for producing uniform droplets. Various types of electric field including DC, AC and DC/AC hybrid types have been applied to a liquid flow. The influence of applied electric field and liquid properties such as conductivity and surface tension on the drop formation has been investigated. The size of droplets was evaluated by optical microscope.