

Size distribution measurement of droplets formed from the two-fluid nozzle

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Droplet size distribution from a two-fluid nozzle with an external mixing was measured by a laser diffraction method. The effect of the dispersion air flowrate, solution flowrate, ethanol fraction in water, and height from the nozzle tip on the droplet size distribution was investigated. As the solution flowrate and the height increased, Dv_{50} increased due to the largely formed droplets and the collision of droplets, respectively. As the dispersion air flowrate and the ethanol fraction increased, Dv_{50} decreased due to the small initial droplets and the lower surface tension, respectively. The dispersion air flowrate was the most important factor to control the droplet size. The minimum Dv_{50} of 10.92 μm was achieved at the dispersion air flowrate of 20 lpm, the solution flowrate of 26.2 ml/min with water, the height of 2.5 cm.