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Coalescence dynamics of a droplet on a sessile droplet MANISH KUMAR, RAJNEESH BHARDWAJ, Department of Mechanical Engineering, Indian Institute of Technology Bombay, Mumbai 400076, India, KIRTI CHANDRA SAHU, Department of Chemical Engineering, Indian Institute of Technology Hyderabad, Sangareddy 502 285, Telangana, India — The coalescence dynamics of an ethanol droplet freely falling on a sessile ethanol droplet resting on glass substrate is investigated experimentally using a high-speed imaging system. The static contact angle of sessile droplet on glass surface is found to be 24° with a standard deviation of 1.3° . The regime maps showing the partial and the complete coalescence behaviors in the plane of the normalized impact height and the volume of the sessile droplet with the diameter and the volume of the impacting droplet are presented. It is observed that the partial coalescence of satellite droplet occurs when the ratio of the volume of the sessile droplet to that of the impacting droplet is greater than two. The size of the satellite droplet is found to be about 0.1 times the size of that of the impacting droplet, which increases with the increase in the normalized impact height and normalized volume of the sessile droplet.

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