

Abstract Submitted  
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**Role of surfactants in the number of secondary droplet generation during drop coalescence** KRISHNAYAN HALDAR, SUDIPTO CHAKRABORTY, IIT Kharagpur — The current study focuses on the variation in secondary droplet generation number with surfactant types and concentrations while surfactant laden drop impinges on a water pool. Cationic, anionic and non-ionic surfactant solutions of different concentrations are used as liquid drop. We observe from high speed imaging technique that secondary droplet generation number increases with increasing concentration for cationic and nonionic whereas it decreases for anionic surfactants. The variation of dimensionless viscosity to surface tension ratio of each surfactant determines the droplet generation number. Also the empirical relations between dimensionless coalescence time and Reynolds, Ohnesorge Number for the impinging drops reveal the dominance of viscous force over inertial and surface forces during the cascade. High viscous force, low inertial force and low surface force reduces the coalescence time. Hence, partial coalescence is faster for drops which high viscosity, low surface tension and low impact velocity and consequently the number of secondary droplet generation in the cascade will also increase.

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