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TRANSPORT PHENOMENA & FLUID MECHANICS

用半导体冰点仪测量盐溶液

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摘要 The experimental results of the deformation and breakup of a single drop immersed in a Newtonian liquid and subjected to a constant shear rate which generated by counter rotating Couette apparatus were presented in this paper. From experimental observations, the breakup occurred by three mechanisms, namely, necking, end pinching, and capillary instability. Quantitative results for the deformation and breakup of drop are presented. The maximum diameter and Sauter mean diameter of daughter drops and capillary thread radius are linearly related to the inverse shear rate and independent of the initial drop size, the dimensionless wavelength which is the wavelength divided by the thread width at breakup is independent of the shear rate and initial drop size, and the deformation of threads follows a pseudo-affine deformation for Ca=Cac large than 2.

关键词 drops, deformation, breakup, Couette shear flow,

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Experimental study of drop deformation and breakup in simple shear flow

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Abstract The experimental results of the deformation and breakup of a single drop immersed in a Newtonian liquid and subjected to a constant shear rate which generated by counter rotating Couette apparatus were presented in this paper. From experimental observations, the breakup occurred by three mechanisms, namely, necking, end pinching, and capillary instability. Quantitative results for the deformation and breakup of drop are presented. The maximum diameter and Sauter mean diameter of daughter drops and capillary thread radius are linearly related to the inverse shear rate and independent of the initial drop size, the dimensionless wavelength which is the wavelength divided by the thread width at breakup is independent of the shear rate and initial drop size, and the deformation of threads follows a pseudo-affine deformation for Ca=Cac large than 2.

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