

Single Bubble Motion Behavior in Viscoelastic Fluids: A Review

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Abstract

The bubble motion behavior in viscoelastic fluid is very important the in related gas-liquid processes. Thus, the emphasis of this review is to discuss the three peculiar phenomena of bubbles rising in viscoelastic fluids, i.e. the formation of the cusp, negative wake and velocity jump discontinuity and to highlight the possible future directions of the subject. The mechanism as well as influence factors on the three peculiar phenomena is discussed in detail. The comparison of results has shown that the change of bubble shape is mainly related to the viscoelasticity of the fluid. However, the mechanism of two-dimensional cusp, the tip-streaming, “blade-edge” tip, “fish-bone” tip and the tail breaking into two different threads phenomena in some special viscoelastic fluids is not very clear. For bubble velocity jump discontinuity phenomenon, viscoelasticity is the most critical factor, and the cusp of bubble, surface modification only played ancillary role.

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