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Experimental study on thermocapillary motion of isolated drop and coalescence problems of drops JINGCHANG XIE, Institute of Mechanics, Chinese Academy of Sciences, HAI LIN, Institute of Mechanic, Chinese Academy of Sciences — Thermocapillary migrations of drops under temperature gradient were studied through ground-based experiment, experiment using drop tower and space experiment in microgravity. The motion of isolated drop at moderate to large Marangoni numbers (Ma) and the interaction of drops were investigated. Experimental data show that the scaled migration velocity of isolated drop, V/V_{YGB} , appears an obvious decrease trend with the increase of Marangoni number up to 5500. This result does not agree with some theoretical predictions. Interferometry was applied in our space experiment to visualize the whole temperature field and to get detailed informations of temperature variation around a moving drop and the thermal wake behind it. Interferometric images indicate that drop's migration very sensitively follows the direction of temperature gradient because of slow migration velocity and microgravity condition. The temperature disturbance around a leading drop and the thermal wake behind it would exist for a quite long time in the real case. The variation of temperature field would substantially affect the migration velocity of a trailing drop in both direction and value, and this would bring about coalescence problems of two or multiple drops.

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