

Visualization of Vapour Bubble Growth

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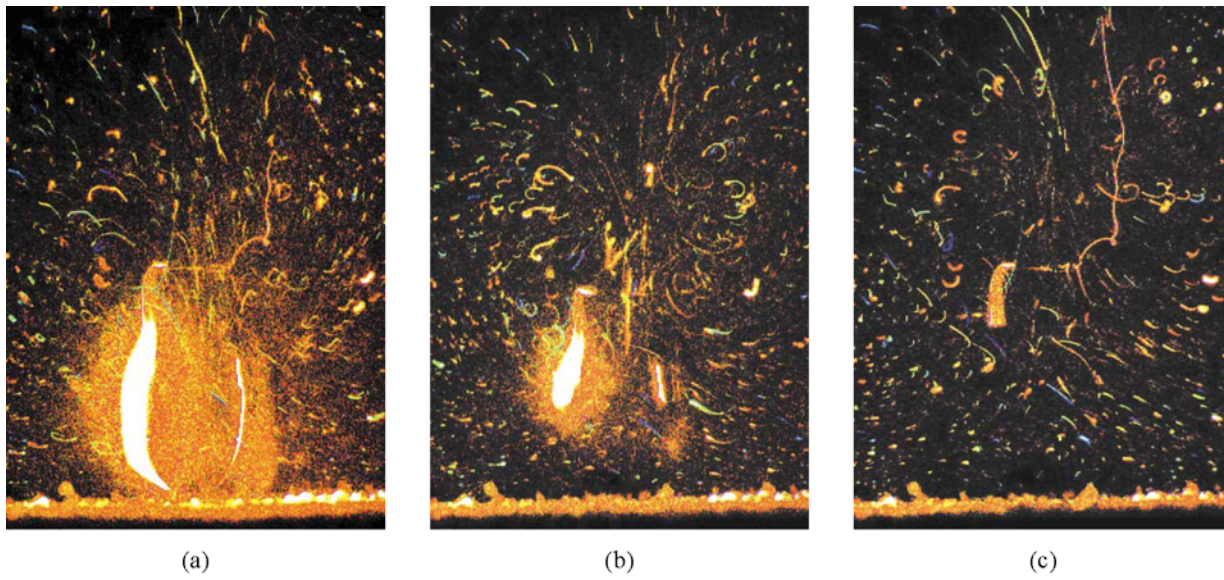


Figure 1

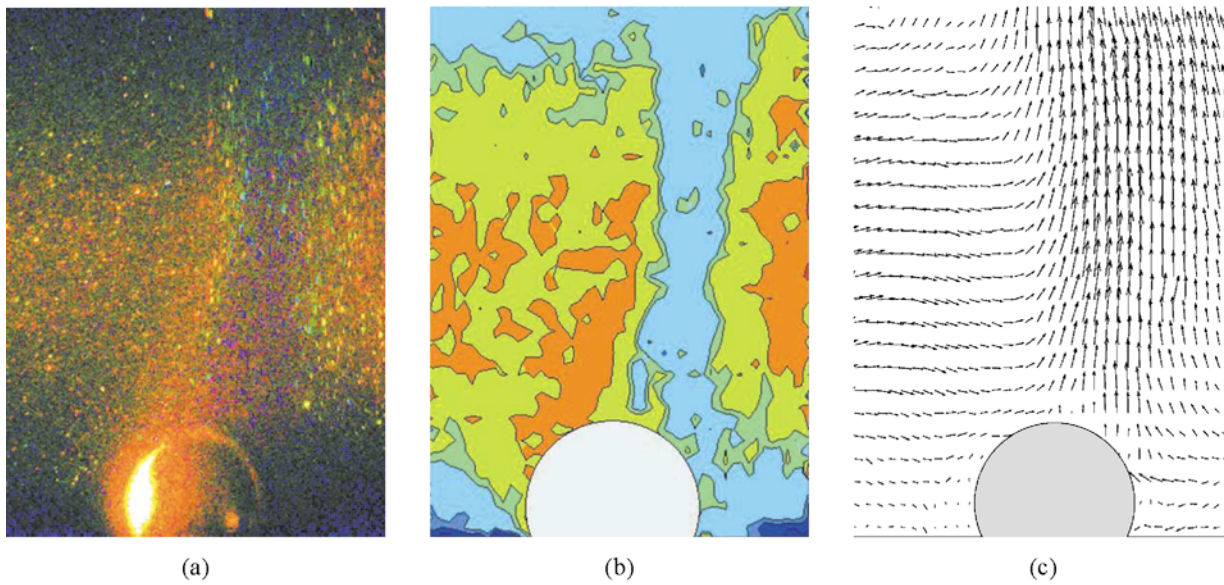


Figure 2

The growth of a single microscopic water vapour bubble under low-pressure condition at the heated surface was investigated experimentally. The flow was seeded with thermochromic liquid crystals. Both velocity and temperature fields surrounding the bubble are evaluated using Particle Image Velocimetry and Thermometry method. Figure 1 shows flow field associated with departure and implosion of the vapour bubble. The light sheet technique is used; hence only reflections from the bubble surface can be seen here. The exact bubble form was recorded from the perpendicular direction using bright field illumination. Long illumination time (20 ms) is used to visualize complexity of the flow structure. Variation of the tracer colour demonstrates non-uniformity of the instantaneous temperature field. After implosion (Fig. 1(c)) few remaining tiny satellite bubbles moving away with a velocity of few m/s can be seen. Figure 2 illustrates (a) flow field surrounding the steady vapour bubble visualized with liquid crystal tracers, (b) the evaluated temperature field and (c) the corresponding velocity field. The experimental conditions are: pressure - 6.kPa, liquid temperature - 35.7°C, heated wall temperature - 57°C.