



VISUALIZATION OF MICRO BUBBLE GROWTH IN THE PRESSURE GRADIENT

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ABSTRACT: Micro bubbles recently gain much attention in wide range of fields. In particular, bubbles with a size of sub-micrometer, have become an attractive research target, partly because of recent technological progress of micro bubble generations, and partly in prospect of their fruitful applications, such as MEMS devices and biological treatments. The bubble size distribution is measured under various pressure conditions. Experiments are performed to visualize the bubble growth in the pressure gradient. In order to set the pressure gradient, a chamber filled with water is connected to a vacuum pump and a valve adjusts pressure between the chamber and the vacuum pump. The time-varying pressure inside the chamber is monitored by a dynamic pressure sensor. The images of the bubble growth are acquired using a microscope and a high speed CCD camera. Then, the diameter of bubble and the rate of bubble generation are evaluated by an image processing technique. As a result, it is presented how the radius of bubbles is stabilized for the change of the amplitude of pressure gradient. The experimental data are compared with the theoretical one solved based on the Rayleigh-Plesset equation.

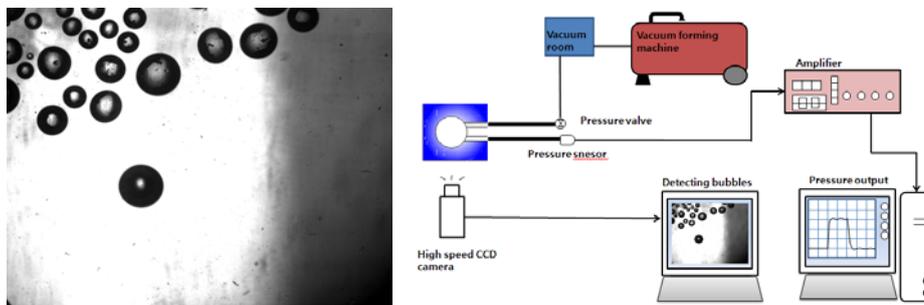


Fig. 1 Image of micro bubble growth (left) and experimental setup for applying pressure gradient (right)

References

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