

An oscillating bubble in a hydrothermal system: Effects of vaporescence and gas diffusion

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Bubble motion in a hydrothermal system in a volcano region is calculated in consideration of effects of vaporescence and gas diffusion. It is supposed that the hydrothermal system is subject to the earthquake wave, and the bubble motion is analyzed for one cycle of the pressure oscillation. The system consists of H_2O and CO_2 : the liquid phase is mainly composed of H_2O and the bubble is of CO_2 . We find considerable effects of vaporescence and gas diffusion on the amplitude and the phase of the bubble oscillation. In the present calculation condition the effect of gas diffusion is greater than the effect of vaporescence. It is expected that, in another condition, the vaporescence is more important than the gas diffusion.