

传递现象

## 竖直窄流道内过冷流动沸腾的单气泡生长模型

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摘要

关键词

[过冷沸腾](#) [气泡生长模型](#) [VOF模型](#)

分类号

## Model for single bubble growth of subcooled flow boiling in vertical narrow rectangular channel

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### Abstract

The process of bubble growth on heating wall in subcooled boiling includes the micro-layer evaporation on heating wall and the bubble top coagulation when the bubbles grow to a certain size and emerge into the subcooled mainstream fluid. Based on this consideration, a model for the single bubble growth of subcooled flow boiling in vertical narrow rectangular channel was proposed. Compared with experimental results, the error of the simulation results using the proposed model is less than  $\pm 25\%$ . The simulation results indicated that as the wall superheat increases, the bubble growth gets faster, with the subcooled degree of mainstream increases, the bubble growth in later stage would be slowed, with the contact angle increases, the contact radius of the bubble bottom and the wall tension would be strengthened, resulting in faster bubble growth to make the bubble to be flat and more easily exposed to the mainstream. The velocity of mainstream has no significant effects on bubble growth rate.

### Key words

[subcooled flow boiling](#) [model of bubble growth](#) [VOF model](#)

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