

## عنوان مقاله:

Numerical study of rising bubble condensation using VOF method with phase change modeling

## محل انتشار:

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## خلاصه مقاله:

In this study, saturated bubble condensation in subcooled liquid, and in presence of gravity, is modeled by development of a FORTRAN code program which considers phase change phenomena in a two phase flow with ability of interfacial tracking. The interface is tracked by Volume of Fluid (VOF) method. Navier-Stokes, energy, and volume fraction equations are solved with considering proper source terms for phase change impacts. To solve the coupling of equations a two way coupling SIMPLE algorithm is used. To validate the results, one dimensional Stefan problem is solved showing good agreement in comparison with analytical results. Afterward, the bubble condensation is studied. History of bubble shape and diameter is compared to the experimental data and the other researches. The mass transfer is modeled by Lee model which has challenge on determining the proper mass transfer intensity factor. The small values for the mass transfer intensity factor lead to significant deviation between results and experimental data, while the excessive larger values cause numerical convergence problem. Changing this value from  $1.25 \times 10^6$  to  $10^7$  improves the results comparing with experimental data and reduces the average error about 20%. Setting  $10^7$  for mass transfer value leads to the best results in this study.

## کلمات کلیدی:

Two phase flow, phase change, condensation, VOF

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1142702>

