

A Study on the Non-Heating CHF Experiments Using Drilled Plates

Yong-Hoon Jeong, Won-Pil Baek and Soon Heung Chang

Department of Nuclear Engineering
Korea Advanced Institute of Science and Technology

ABSTRACT

The critical heat flux (CHF) has been studied by many researchers from the discovery of that phenomena, and considerable experiments have been conducted. From the beginning of the critical heat flux (CHF) research, experiments have been conducted using direct heating or in-direct heating methods. However, heating experiment is not easy to perform in some aspects: difficulty of heating method, large electric power source, probable failure of test section, electricity related risk, large cost, etc. In this paper, it is suggested that more convenient and profitable way to study pool boiling CHF phenomena using air bubble generated on the drilled plate and overlaying water. By blowing air through drilled plate in water or other fluid, we can model the real boiling on the plate by air-bubbling on the plate. Through the photographic observation of bubble generation, the similar behavior of air bubble is observed comparing with real steam bubble. And, through measuring void fraction near the plate surface using a conduction probe, macrolayer thickness has been estimated, and the difference between nucleate boiling and CHF has been examined. As a result, through this study, the possibility of non-heating CHF experiment has been examined, and the possible applications of this method have been introduced.