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微小重力環境における流動沸騰の熱伝達特性

Heat Transfer Characteristics of Flow Boiling in Microgravity

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1. Overview

Flow boiling experiments have been conducted during July 2017 - March 2018, and February 2019 - July 2019 onboard International Space Station (ISS) to clarify the influence of gravity on flow boiling. **Figure. 1** shows the experimental facility. Heated section discussed here is the metal heated section consisting of a single copper tube with the inner diameter of 4 mm and heated length of 368 mm. Two electric sheath heaters having an outer diameter of 1.28 mm are spirally wound and soldered in the grooves on the outer surface of the metal heated tube. The heaters can be applied maximum 300 W to the metal tube. Ten thermocouples for tube inner wall temperature measurements are soldered at 33.5 mm intervals. Experiments were carried out under the conditions of various mass velocities, heat fluxes and inlet subcooling/quality. In our presentation, the heat transfer characteristics including heat transfer coefficients in 1g and microgravity will be reported.

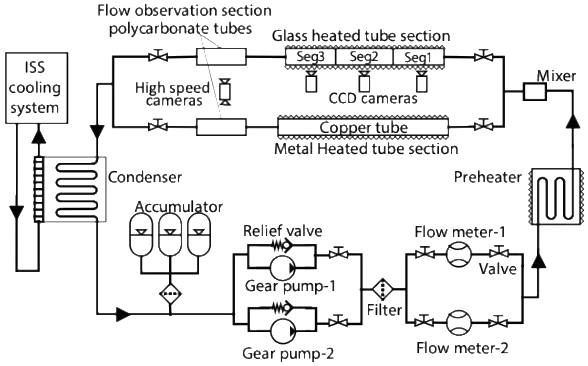

Figure 1. Experimental flow loop using ISS experiment.

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