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Numerical investigation of the droplet condensation on the horizontal surface with patterned wettability[1] JAEYONG CHO, JOONSANG LEE, Yonsei Univ — The condensation is the one of the efficient heat transfer phenomenon that transfers the heat along an interface between two phases. This condensation is affected by the wettability of surface. Heat transfer rate can be improved by controlling the wettability of surface. Recently, the researches with patterned wettability, which is composed by a combination of hydrophilic and hydrophobic surface, have been performed to improve the heat transfer rate of condensation. In this study, we performed numerical simulation for condensation of droplet on the patterned wettability, and we analyze condensation phenomenon on the wettability pattered surface through the kinetic energy, heat flux curve, and droplet shape in the vicinity of the droplet. When we performed numerical simulations and analyzing the condensation with patterned wettability, we used the lattice Boltzmann method for the base model, and phase change was solved by Peng-Robinson equation of sate. We can find that the droplet is generated at the bottom surface and high condensation rate can be maintained on the patterned wettability.

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