

Impact dynamics of a colloid suspension droplet on superhydrophobic surfaces measured using quartz crystal microresonator and high speed camera

김관호, 전상민[†]

POSTECH

(jeons@postech.ac.kr[†])

We investigated the impact dynamics of a polystyrene colloid solution on superhydrophobic surfaces using a high speed camera and a quartz crystal microresonator (QCM). Gold nanostructures were synthesized on QCM surfaces and treated with perfluorooctane ethyl thiol molecules to obtain superhydrophobic properties. Upon collision, the suspension droplet spreads, retracts, and bounced from the surface. The high speed camera analysis showed that the impact dynamics was almost constant regardless of colloid concentrations. However, QCM measurements showed that dramatic changes in the resonance frequency occurred as the concentration increased above 20%. We attributed the sharp decrease in frequency to the phase transition of the suspension from liquid to solid, which could not be observed in conventional high speed camera analysis.