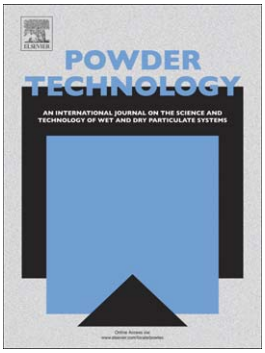

Effect of bubble size on bubble-particle attachment and film drainage kinetics - A theoretical study

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PII: S0032-5910(17)30744-1
DOI: doi:10.1016/j.powtec.2017.09.007
Reference: PTEC 12812

To appear in: *Powder Technology*

Received date: 18 May 2017
Revised date: 8 August 2017
Accepted date: 6 September 2017

Please cite this article as: Yaowen Xing, Xiahui Gui, Yijun Cao, Effect of bubble size on bubble-particle attachment and film drainage kinetics - A theoretical study, *Powder Technology* (2017), doi:10.1016/j.powtec.2017.09.007

Effect of bubble size on bubble-particle attachment and film drainage kinetics - A theoretical study

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Abstract

Effect of bubble size on bubble-particle attachment and film drainage was studied based on the extended Derjaguin-Landau-Verwey-Overbeek theory and the Stefan-Reynolds flat film model. The disjoining pressure isotherms and wetting film drainage kinetics between a bubble and an model silica with different hydrophobic force decay lengths were calculated theoretically. It is found that the results depend on the shapes of total disjoining pressure isotherms. Film formed between a small bubble and silica surface always has faster drainage kinetics compared to that formed between a big bubble and silica surface due to the high Laplace pressure. For a monotonic repulsive total disjoining pressure, the wetting film is thermodynamically stable and the final equilibrium film thickness decreases with decreasing