Abstract Submitted for the DFD19 Meeting of The American Physical Society

Dynamics of gas bubbles and slugs in 2-dimensional porous media PETR DENISSENKO, University of Warwick, RUFAT ABIEV, St.Petersburg State Institute of Technology, SAM TUCKER HARVEY, EVGENY REBROV, University of Warwick — A 3d-printed 2-dimensional channel is used to study 2-phase flow in a bench-scale trickle-bed reactor. As the maximum size of a spherical bubble is limited by the pore size, slugs with complex shapes form when bubbles merge. The slugs do not move constantly but perform intermittent manoeuvres. Breakup, coalescence, and propagation dynamics of the slugs are studied in relation to their length. The balance between pressure, viscosity, and surface tension terms is considered to predict slug propagation dynamics. Interaction between slugs is considered. Results are interpreted in the context of the gas hold-up and the flow quality in relation to mass transfer between gas phase and liquid phase.

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Date submitted: 01 Aug 2019

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