

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Mesler entrainment in alcohols J.R. SAYLOR, R.K. SUNDBERG, Clemson University — When a drop impacts a flat surface of the same liquid at an intermediate velocity, the impact can result in the formation of a very large number of very small bubbles. At lower velocities, drops bounce or float, and at larger velocities a single bubble forms, or there is a splash. The formation of large numbers of small bubbles during intermediate velocity impacts is termed Mesler entrainment and its controlling mechanism is poorly understood. Existing research has shown that Mesler entrainment is highly irreproducible when water is the working fluid, and very reproducible when silicone oil is the working fluid. Whether this is because water is problematic, or silicone oil is uniquely well-suited, is unclear. To answer this question, experiments were conducted using three different alcohols. The results of these experiments were very reproducible for all alcohols tested, suggesting that there is something unique about water which accounts for its lack of reproducibility. The data from these experiments were also used to develop a dimensionless group that quantifies the conditions under which Mesler entrainment occurs. This dimensionless group is used to provide insight into the mechanism of this unique method of bubble formation.

J. R. Saylor
Clemson University

Date submitted: 02 Aug 2012

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