Laboratory and Table-Top Fluid Mixing Experiments for the Laboratory or Classroom

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Abstract

While teaching AIChE and University Fluid Mixing Courses, several laboratory and table-top fluid mixing experiments have been developed. Those experiments are explained and documented to the extent that others can duplicate and use the experiments. The experiments are:

1. Impeller positioning in unbaffled vessels, with axial flow impellers, to eliminate vortexing and achieve fully baffled process results.
2. Laminar mixing in static mixers.
3. Vortex depth with no baffling, full baffling and parital baffling.
4. Solids suspension – just suspended speed
5. Solids dissolving – dissolving time
6. Gas dispersion with varying baffling: none, parital and full
7. Gas dispersion – impeller flooding
8. Laminar and turbulent blending
9. Upper Viscosity (i.e., lower Impeller Reynolds Number) limit for mixing impellers
10. Just dispersed speed for liquid-liquid mixing.
11. Microscopy determination of drop sizes in liquid-liquid dispersions to test impellers for liquid-liquid dispersion.