

Abstract Submitted
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An undergraduate lab on measuring fluid viscosity using a miniature ball drop device¹ JAY TANG, Brown University — I would like to describe measurement of fluid viscosity using a small ball drop device. It requires as little as 100 microliters of fluid. Each measurement can be performed in seconds. Through simple experimentation, students observe fluid flow confined in a thin cylindrical tube. They analyze forces and torques on a tiny ball falling and rolling down in an inclined tube. They gain practice in observing and identifying sources of errors and variability in their measurements beyond those indicated by standard error bars. The experiment is designed to yield reliable viscosity values by operating at properly chosen tilt angles and with calibration using well-characterized fluids such as mixtures of glycerol and water. The technique is also useful in research and technological applications as the device is easy to assemble and it allows the measurement of viscosity even when the fluid samples are too small to measure using most commercial viscometers or rheometers.

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