

Abstract Submitted
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Measure Advancing, Receding and Dynamic Contact Angles of granular materials in a close column GERARDO CALLEGARI, MINGLU LI, Rutgers University, Mechanical and Aerospace Engineering Department, SARA MOGHTADERNEJAD, Rutgers University, Chemical and Bio-Chemical Engineering Department, GERMAN DRAZER, Rutgers University, Mechanical and Aerospace Engineering Department — Wetting properties of granular materials are usually obtained by the Washburn column technique. One problem is that the effective contact angle measured is dynamic and variable. The open column technique also allows to measure static advancing contact angle when the interface stops because the driving capillary pressure is balanced by the hydrostatic pressure. However, when particle diameters are in the range of tens of microns the static condition cannot be achieved at practical heights. Also, the open column device cannot be used to measure receding contact angles or contact angles of non-wetting liquids. Dynamics of a close column filled with granular material of different particle sizes where the liquid mass, the enclosed air pressure and the front position are monitored as a function of time is studied. Contact angle is calculated in dynamic and advancing static conditions. Then, a Syringe pump is used to increase the pressure inside the column so that the receding contact angle can also be studied. Supplementary experiments with a reference liquid that completely wets the powder are performed. Using a second liquid decouples the properties of the bed from the result and allows to measure the contact angles without making assumptions on the pore size or geometry.

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