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Capillary penetration into periodically corrugated plates[1] MARINA MEDINA, Universidad Nacional Autonoma de Mexico, FAUSTO SANCHEZ, FIME - Universidad Autonoma de Nuevo Leon, FRANCISCO HIGUERA, ETS Ingenieros Aeronauticos, UPM, ABRAHAM MEDINA, SEPI ESIME - IPN — Spontaneous capillary rise of viscous liquid between two sinusoidally corrugated plates, which are vertically placed in a gravitational field, is studied. The effect of geometrical variations perpendicular to the direction of penetration on the rate of capillary penetration is analyzed by using the lubrication theory. Numerical solutions of the Reynolds equations for the local free surface and pressure distribution in the fluid and the spatially-averaged penetration length are given. It was found that the amplitude of corrugation determines the time necessary to reach the equilibrium length when constant average capillary gap width is applied. These results also illustrate some features experimentally observed in spontaneous penetration of liquids into porous materials where the permeability changes spatially. Many geological and technological applications involve this type of anomalies.

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