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Capillary rise in wedges ALEXANDRE PONOMARENKO, CHRISTOPHE CLANET, DAVID QUERE, ESPCI — A wetting liquid put into contact with a thin vertical tube rises spontaneously in it, reaching a final height $z = h_e$ given by Jurin's law: $\frac{h_e}{r} = 2\left(\frac{a}{r}\right)^2 cos\theta_c$ where r is the radius of the tube, $a = \sqrt{\frac{\gamma}{\rho g}}$ is the capillary length, based on the liquid surface tension γ, liquid density ρ and gravity g, and θ_c is the contact angle characterizing the wetting of the liquid on the solid.— Also, when $z \ll h_e$, where gravity can be neglected, the front of the liquid follows Washburn's law: $z = \sqrt{2\frac{\gamma r cos\theta_c}{\eta}t}$, where η is the liquid viscosity.— This works for all systems having a "closed" geometry, that is a scaling length, provided this scaling length is smaller than a.— We use systems of "open" geometry, without scaling length, typically wedges with different geometries and show both experimentally and theoretically that the meniscus rises following the universal law : $\frac{h(t)}{a} \sim (\frac{\gamma}{\eta a}t)^{1/3}$. It differs from the case of "closed" geometry because it rises indefinitely and with a different dynamic. It is universal in the sense that it does not depend on the special geometry of the wedge.

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