

along with the boundary conditions

$$H(z=0) = W/2, \quad H(z=L) = H_f, \quad (dH/dz)_{z=L} = 0$$

The solution is

$$H(z) = \left(\frac{W - 2H_f}{L^2} \right) \left(\frac{z^2}{2} - zL \right) + \frac{W}{2} \quad (\text{A15})$$

which is a parabolic film thickness.

3. Finite surface tension ($0 < Ca < k$)

Eq. (A11) is cast in the form

$$H^3 \left(\frac{d^3 H}{dz^3} - \frac{St \cdot Ca}{H_f^2} \right) + 3Ca(H - H_f) = 0 \quad (\text{A16})$$

with no apparent analytic solution. For a special case of horizontal coating ($St = 0$), and since usually $H_f / W \ll 1$, the transformation

$$H^* = \frac{H}{W}, \quad z^* = \frac{z}{W} \quad (\text{A17})$$

reduces Eq. (A16) to

$$H^{*3} \frac{d^3 H^*}{dz^{*3}} + 3Ca \left(H^* - \frac{H_f}{W} \right) = 0 \quad (\text{A18})$$

which predicts that near the inlet, where $H^* \approx 1$, the film decays with rate depending on the Ca . Near the other end, where $H^* \approx 2H_f/W$, the film becomes flat, surface tension becomes unimportant, and therefore the slope is zero. Eq. (A18) can be solved asymptotically by perturbation techniques. \square

CHEATING

Continued from page 17.

this paper. Perhaps these considerations will motivate us to develop innovative ethics curricula and to improve monitoring of course activities, so that our disciplines may be able to better safeguard (and perhaps even increase) their already high levels of excellence.

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