Surface tension

Surface Phenomena

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Related Effects

- capillary effects

- influence on thermodynamic equilibrium

- surface tension

Specific Surface Area

$$= \frac{\text{Surface Area of Pores}}{\text{Volume of Solid}}$$

Example (for spheres)

$$= \frac{3}{r} \quad (\text{units } m^{-1})$$

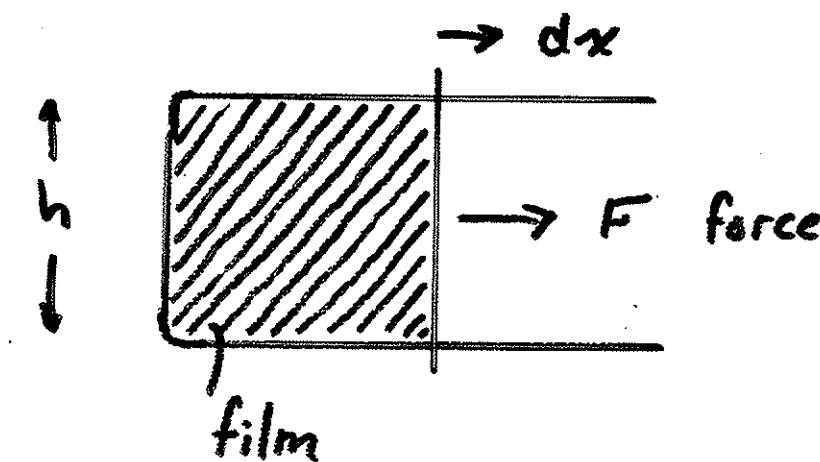surface phenomena increase with specific surface area

sandstone vs. shale?

analogy between surface and elastic membrane

work dW must be done to increase area by dA

$$dW = \gamma dA$$

surface energy (Jm^{-2}) or
surface tension (Nm^{-1})

$$\rightarrow dx$$
$$h$$
$$\rightarrow F \text{ force}$$
$$film$$

Work $dW = F \cdot dx = \gamma dA = \gamma(2h\,dx)$

$$\therefore \gamma = \frac{F}{2h}$$