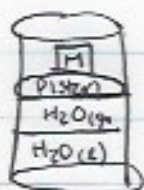


## 8.7 The vapor Pressure of a Pure substance Depends on the Applied Pressure

- to calculate partial pressure of water in organ-water mixture, following equilibrium condition holds

$$M_{\text{liquid}}(T, P) = M_{\text{gas}}(T, P)$$



(state of system in which  $P$  remains constant at  $3.016 \times 10^5 \text{ Pa}$  as long as temp remains constant)

$$P_{\text{external}} = 0.0316 \text{ bar}$$

$$RT \ln \left( \frac{P}{P^*} \right) = V_m^{\text{liquid}} (P - P^*)$$

## 8.8 Surface Tension

- The work associated with the creation of a additional surface area at constant  $V$  and  $T$  is

$$dA = \gamma d\sigma$$

$A$  = helmholz energy

$\gamma$  = surface tension

$\sigma$  = unit element of area

- surface tension has units of energy/area of  $\text{J m}^{-2}$  equivalent to  $\text{N m}^{-1}$

- capillary rise / capillary depression ~ consequences of pressure differential across a curved surface
- contact angle  $\theta$ 
  - wetting  $\theta = 0^\circ$
  - nonwetting  $\theta = 180^\circ$