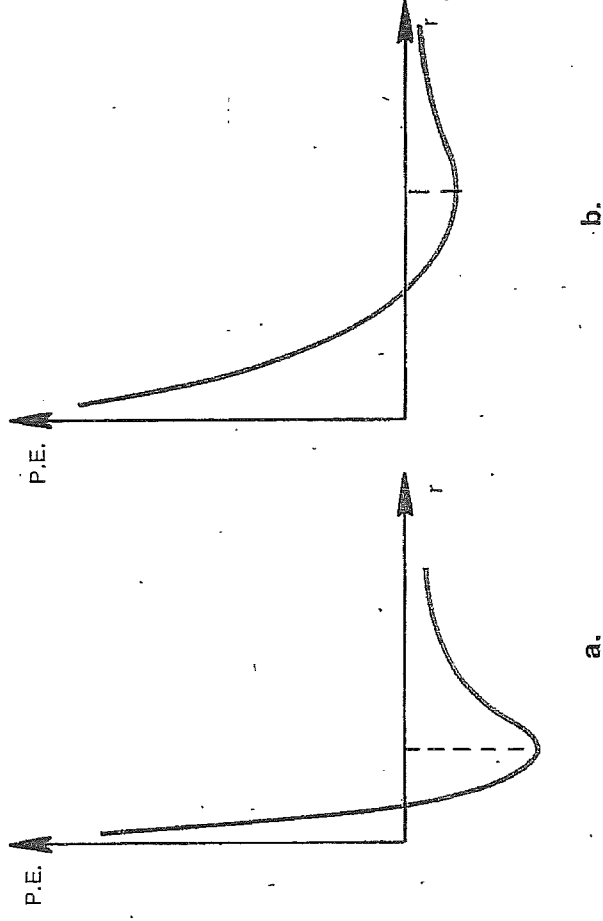


In-class problem linked to lecture pages 295-302:

The intermolecular potential energy as a function of distance  $r$  between molecules for two substances "a" and "b" is shown below.

- (i) Which substance do you expect to vaporize (at atmospheric pressure) at a higher temperature?
- (ii) For which substance do you expect the constant  $a$  of the Van der Waals equation to be larger?
- (iii) What about the constant  $b$  of the same equation?



In-class 295-302

$$\text{For } \Delta W = \Delta N = 0, \\ \Delta E = \Delta Q = C_V \Delta T$$

(a) A is bound more tightly, requires greater  $\Delta Q$   
to vaporize  $\rightarrow$  higher  $\Delta T$

(b) Constant  $a$  is bond strength.  
Lower for A

(c) Constant  $b$  is volume.  
Larger for B