STATE POSTULATE

The number of independent, intensive properties needed to fix the state* of a substance is equal to the number of quasistatic work modes plus one.

* State: condition of a system described by the value of its properties

circular definition: see definition, circular

definition, circuler: see circular definition

- A _____ _____ HAS ONLY _____ WORK MODE
- A _____ _____ _____ HAS ONLY _____

WORK MODE, AND ITS _____ WORK.

THE STATE POSTULATE FOR A SIMPLE COMPRESSIBLE SYSTEM SAYS THAT YOU NEED...

PROPERTIES

(TO FIX THE STATE.)

EXAMPLES

$u = u(\quad)$

$v = v(\quad)$

$h = h(\quad)$

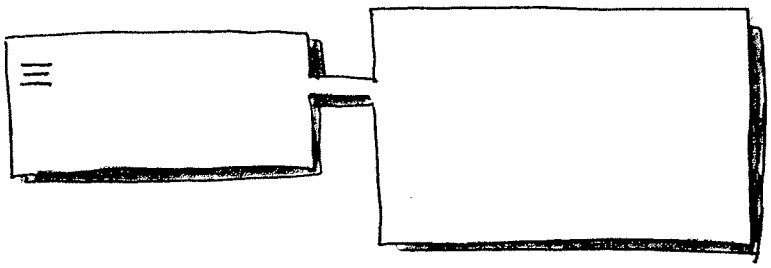
$p = p(\quad)$

WHY IS THIS ONE SO IMPORTANT?

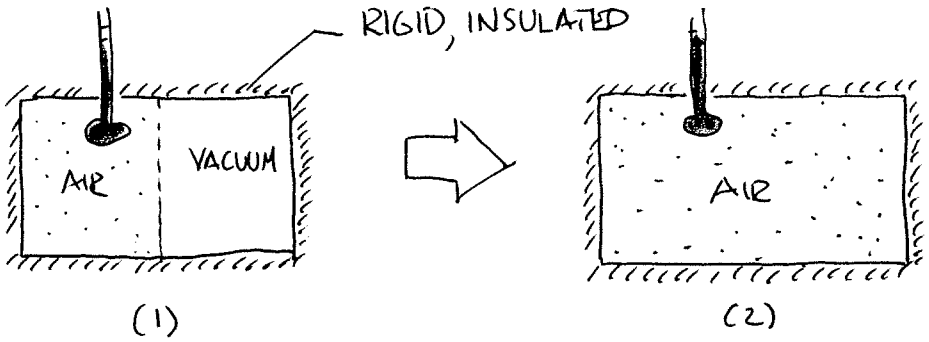
FOR ANYTHING ...

$u = u(v, T)$

$du =$ ( ) + ( )



JOULE'S EXPERIMENT:



FROM CONS. of ENERGY

$U_2 = U_1$ & $\therefore$ _____

$$du = \left(\frac{\partial u}{\partial v}\right)_T dv + \left(\frac{\partial u}{\partial T}\right)_v dT$$

$du =$

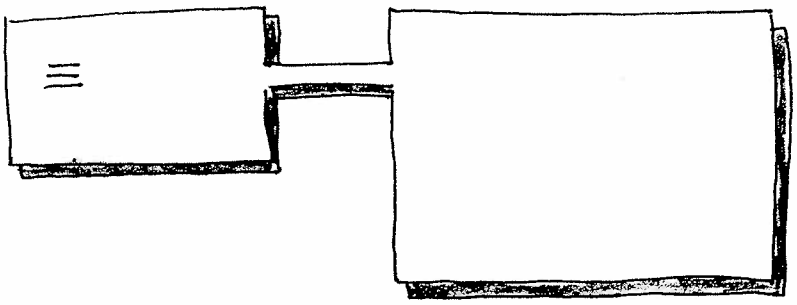
$u_2 - u_1 =$

*

* NEVER MIX YOUR IDEAL GAS TABLES!

$h = h(\ ,\ )$

$dh =$ ( ) + ( )



RECALL THE DEF'N of h:

$h \equiv$

AND SO FOR AN IDEAL GAS $h =$ *

$dh =$

$dh =$

$h_2 - h_1 =$

IFF c_v = CONST AND c_p = CONST

$u_2 - u_1 = c_v(T_2 - T_1)$

$h_2 - h_1 = c_p(T_2 - T_1)$

* CAN YOU SHOW THAT $R = c_p - c_v$?