Example 2 discussed in class but not completed (you were supposed to complete it).

Given P, V and T data for the amount of CO produced determine how many moles of Sb_4O_6 were required?

$$Sb_4O_6\,(s) \;+\; 6\,C\,(g) \;\text{------>}\; 4\,Sb\,(s) \;+\; 6\,CO\,(g)$$

If we knew the moles of CO produced we could do a mole-to-mole stoichiometry problem.

We can determine the moles of CO given the P, V, T data using the Ideal Gas Law:

Use IGL to calculate the moles of CO

$$n = \frac{PV}{RT} = \frac{(0.987\ \text{atm})\ (3.20\ \text{L})}{(0.0821\ \text{L•atm/mol•K})\ (30\underline{\mathbf{0}}.15\ \text{K})}$$

$$= 0.12\mathbf{8}1\ \text{mol CO}$$

Convert the moles of CO to moles of Sb_4O_6

$$?\ \text{mol } Sb_4O_6 = 0.12\mathbf{8}1\ \text{mol CO} \times \frac{1\ \text{mol } Sb_4O_6}{6\ \text{mol CO}}$$

$$= 0.021\underline{\mathbf{3}}6\ \text{mol } Sb_4O_6$$

$$= 0.0214\ \text{mol } Sb_4O_6$$