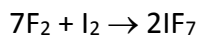


Answer on Question #82583 – Chemistry – General Chemistry

When gaseous F_2 and solid I_2 are heated to high temperatures, the I_2 sublimes and gaseous iodine heptafluoride forms. 2.80×10^2 torr of F_2 and 3.30 g of solid I_2 are put into a 2.50 L container at 2.50×10^2 K and the container is heated to 5.50×10^2 K.

(a) What is the final pressure?

Solution:



1) $PV = nRT$

$$n(F_2) = PV/(RT) = (280 \text{ Torr}) \times (2.50 \text{ L}) / ((62.36 \text{ L}\cdot\text{Torr}\cdot\text{K}^{-1}\cdot\text{mol}^{-1}) \times (250 \text{ K})) = 0.045 \text{ moles}$$

2) $n = m/M$

$$n(I_2) = (3.30 \text{ g}) / ((2) \times (126.90 \text{ g/mol})) = 0.013 \text{ moles}$$

3) F_2 is limiting reactant

4) 7 moles F_2 – 2 moles IF_7

$$0.045 \text{ moles } F_2 - x \text{ moles } IF_7$$

$$x = 0.013 \text{ moles}$$

5) $PV = nRT$

$$P = nRT/V = (0.013 \text{ moles}) \times (62.36 \text{ L}\cdot\text{Torr}\cdot\text{K}^{-1}\cdot\text{mol}^{-1}) \times (550 \text{ K}) / (2.50 \text{ L}) = 178 \text{ Torr}$$

Answer provided by www.AssignmentExpert.com