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#8, 9, 37, 48, 50, 65, 67, 105, 106

CALVIN

8) Volume decreases Ex $1X + 1Y \rightarrow 1XY$

2 mole $\rightarrow$ 1 mole

9) D

37) a) $4.8\ \text{atm} \left| \frac{760\ \text{mmHg}}{1\ \text{atm}} \right. = \boxed{3.6 \times 10^3\ \text{mmHg}}$ b) $3.6 \times 10^3\ \text{mmHg} \left| \frac{760\ \text{torr}}{760\ \text{mmHg}} \right. = \boxed{3.6 \times 10^3\ \text{torr}}$

c) $4.8\ \text{atm} \left| \frac{1.013 \times 10^5\ \text{Pa}}{1\ \text{atm}} \right. = \boxed{4.9 \times 10^5\ \text{Pa}}$ d) $4.8\ \text{atm} \left| \frac{14.7\ \text{psi}}{1\ \text{atm}} \right. = \boxed{71\ \text{psi}}$

48)

	P	V	n	T
a)	7.74×10^3 Pa	12.2 mL	$\boxed{3.81 \times 10^{-5}\ \text{mol}}$	25°C
b)	$\boxed{1.79\ \text{atm}}$	43.0 mL	0.421 mol	223 K
c)	455 torr	$\boxed{3.6\ \text{L}}$	4.4×10^{-2} mol	331°C
d)	745 mmHg	11.2 L	0.401 mol	$\boxed{334\ \text{K}}$ or $\boxed{61°\text{C}}$

50) a) $PV = nRT$

$n = \frac{PV}{RT} = \frac{(1.00\ \text{atm})(6.0\ \text{L})}{(0.0821\ \frac{\text{L·atm}}{\text{mol·K}})(298\ \text{K})} = \boxed{0.25\ \text{mol}}$

b) $\boxed{0.48\ \text{mol}}$

c) $\boxed{0.11\ \text{mol}}$

(65) $4Al_{(s)} + 3O_{2(g)} \rightarrow 2Al_2O_{3(s)}$

2.00 L

$$\frac{2.00\ \cancel{L\ O_2}}{} \left| \frac{1\ \cancel{mol\ O_2}}{22.4\ \cancel{L\ O_2}} \right| \frac{4\ \cancel{mol\ Al}}{3\ \cancel{mol\ O_2}} \left| \frac{26.98\ g\ Al}{1\ \cancel{mol\ Al}} \right. = \boxed{3.21\ g\ Al}$$

OR

$PV = nRT$

$$n = \frac{PV}{RT} = \frac{(1\ \cancel{atm})(2.00\ \cancel{L})}{\left(0.0821\ \frac{\cancel{L \cdot atm}}{\cancel{mol \cdot K}}\right)(273\ \cancel{K})} = 0.0892\ mol$$

$$\frac{0.0892\ \cancel{mol\ O_2}}{} \left| \frac{4\ \cancel{mol\ Al}}{3\ \cancel{mol\ O_2}} \right| \frac{26.98\ g\ Al}{1\ \cancel{mol\ Al}} = \boxed{3.21\ g\ Al}$$

(67) $2NaN_{3(s)} \rightarrow 2Na_{(s)} + 3N_{2(g)}$

70.0 L

$$\frac{70.0\ \cancel{L\ N_2}}{} \left| \frac{1\ \cancel{mol\ N_2}}{22.4\ \cancel{L\ N_2}} \right| \frac{2\ \cancel{mol\ NaN_3}}{3\ \cancel{mol\ N_2}} \left| \frac{65.02\ g\ NaN_3}{1\ \cancel{mol\ NaN_3}} \right. = \boxed{135\ g\ NaN_3}$$

OR

$PV = nRT$

$$n = \frac{PV}{RT} = \frac{(1.00\ \cancel{atm})(70.0\ \cancel{L})}{\left(0.0821\ \frac{\cancel{L \cdot atm}}{\cancel{mol \cdot K}}\right)(273\ \cancel{K})} = 3.12\ mol\ N_2$$

$$\frac{3.12\ \cancel{mol\ N_2}}{} \left| \frac{2\ \cancel{mol\ NaN_3}}{3\ \cancel{mol\ N_2}} \right| \frac{65.02\ g\ NaN_3}{1\ \cancel{mol\ NaN_3}} = \boxed{135\ g\ NaN_3}$$

105) 1) increase pressure
2) decrease temperature

106) 1) double the moles of gas
2) double absolute temperature
3) cut the pressure in half