

Chapter 6 Homework Key, Part 2
18, 21, 24, 26, 33, 35, 46, 54, 56, 62

18. Use Boyle's Law: $P_1V_1 = P_2V_2$

$$(a) \frac{P_1V_1}{P_2} = V_2 = \frac{150 \text{ atm} \times 60.0 \text{ L}}{0.925 \text{ atm}} = 9730 \text{ L}$$

$$(b) \frac{9730 \text{ L}}{6.0 \text{ L/min}} = 1620 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}} = 27.0 \text{ hr}$$

21. Use Boyle's Law: $P_1V_1 = P_2V_2$

$$\frac{P_1V_1}{P_2} = V_2 = \frac{0.994 \text{ atm} \times 1.88 \text{ L}}{0.497 \text{ atm}} = 3.76 \text{ L}$$

$$24. T_2 = \frac{V_2T_1}{V_1} = \frac{3V_1 \times 273 \text{ K}}{V_1} = 819 \text{ K}$$

26. Convert all temperatures to Kelvin and use Charles's Law: $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

$$\frac{V_1T_2}{T_1} = V_2 = \frac{1.00 \text{ L} \times 310 \text{ K}}{263 \text{ K}} = 1.18 \text{ L}$$

33. (a) $2.12 \text{ g/L} \times 22.4 \text{ L/mol} = 47.5 \text{ g/mol}$

(b) $2.97 \text{ g/L} \times 22.4 \text{ L/mol} = 66.5 \text{ g/mol}$

35. (a) decrease (b) decrease (c) increase

46. $pV = nRT$

$$p = \frac{nRT}{V} = \frac{0.0456 \text{ mol} \times 0.082057 \text{ L atm/mol K} \times 302 \text{ K}}{7.50 \text{ L}} = 0.151 \text{ atm}$$

54. (a) All have the same number of atoms (Avogadro's principle).

(b) flask Z

(c) flask X

(d) All have the same number of moles.

56. Amonton's Law: $\frac{P_1}{T_1} = \frac{P_2}{T_2}$

$$\frac{P_1T_2}{T_1} = P_2 = \frac{1.32 \text{ atm} \times 283 \text{ K}}{298 \text{ K}} = 1.25 \text{ atm}$$

62. c