

## Worksheet - on Basic Stoichiometry - Mole Chart

### Part 1: Mole <-> Mass Conversions

$$1.) 0.436 \text{ mol } NH_4Cl \times \frac{53.5 \text{ g}}{1 \text{ mol}} = 23.3 \text{ g } NH_4Cl$$

$$2.) 2.360 \text{ mol } PbO \times \frac{223.2 \text{ g}}{1 \text{ mol}} = 526.8 \text{ g } PbO$$

$$3.) 0.031 \text{ mol } Al_3 \times \frac{407.71 \text{ g}}{1 \text{ mol}} = 13 \text{ g } Al_3$$

$$4.) 1.077 \text{ mol } Mg_3(PO_4)_2 \times \frac{262.87 \text{ g}}{1 \text{ mol}} = 283.1 \text{ g } Mg_3(PO_4)_2$$

$$5.) 0.50 \text{ mol } Ca(NO_3)_2 \times \frac{164.10 \text{ g}}{1 \text{ mol}} = 82 \text{ g } Ca(NO_3)_2$$

$$6.) 23.5 \text{ g } NaCl \times \frac{1 \text{ mol}}{58.44 \text{ g}} = 0.402 \text{ mol } NaCl$$

$$7.) 0.773 \text{ g } NaCN \times \frac{1 \text{ mol}}{49.01 \text{ g}} = 0.0158 \text{ mol } NaCN$$

$$8.) 0.250 \text{ g } H_2O \times \frac{1 \text{ mol}}{18.01 \text{ g}} = 0.0139 \text{ mol } H_2O$$

$$9.) 169.45 \text{ g } Ca(CH_3COO)_2 \times \frac{1 \text{ mol}}{158.18 \text{ g}} = 1.0712 \text{ mol } H_2O(10.) 79.9 \text{ mol } KMnO_4 \times \frac{158.04 \text{ g}}{1 \text{ mol}} = 12600 \text{ g } KMnO_4$$

$$11.) 0.0455 \text{ mol } HCl \times \frac{6.022 \times 10^{23} \text{ molec}}{1 \text{ mol}} = 2.74 \times 10^{22} \text{ molec } HCl$$

$$12.) 1.2 \text{ mol } gluc \times \frac{6.022 \times 10^{23} \text{ molec}}{1 \text{ mol}} = 7.2 \times 10^{23} \text{ molec } gluc$$

$$13.) 0.32 \text{ mol } NaHCO_3 \times \frac{6.022 \times 10^{23} \text{ molec}}{1 \text{ mol}} = 1.9 \times 10^{23} \text{ molec } NaHCO_3$$

$$14.) 6.99 \times 10^{24} \text{ molec } NaNO_2 \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ molec}} = 11.6 \text{ mol } NaNO_2$$

$$15.) 1.255 \times 10^{25} \text{ molec } MgCl_2 \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ molec}} = 20.84 \text{ mol } MgCl_2$$

$$16.) 7.2 \times 10^{23} \text{ atom } He \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ atom}} = 1.2 \text{ mol } He$$

$$17.) 2.35 \text{ mol } Na_3PO_4 \times \frac{6.022 \times 10^{23} \text{ molec}}{1 \text{ mol}} \times \frac{4 \text{ atom}}{1 \text{ molec}} = 5.66 \times 10^{24} \text{ atom } O$$

$$18.) 0.0022 \text{ mol } Pb(CH_3COO)_4 \times \frac{6.022 \times 10^{23} \text{ molec}}{1 \text{ mol}} \times \frac{4 \text{ atom}}{1 \text{ molec}} = 5.3 \times 10^{21} \text{ atom } C$$

$$19.) 2.55 \times 10^{24} \text{ molec } NaNO_3 \times \frac{3 \text{ atom } O}{1 \text{ molec}} \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ atom } O} = 12.7 \text{ mol } O$$

$$20.) 1.046 \times 10^{23} \text{ molec } NH_4OH \times \frac{5 \text{ atom } H}{1 \text{ molec}} \times \frac{1 \text{ mol}}{6.022 \times 10^{23} \text{ atom } H} = 0.8684 \text{ mol } H$$

$$21.) \frac{0.694 \text{ mol } NaOH}{0.400 \text{ L}} = 1.74 \text{ M } NaOH$$

$$22.) \frac{1.25 \text{ mol } MgBO_3}{2.5 \text{ L}} = 0.50 \text{ M } MgBO_3$$

$$23.) \frac{0.0039 \text{ mol } PbCl_2}{0.025 \text{ L}} = 0.16 \text{ M } NaOH$$

$$24.) 0.500 \text{ L } Na_2O \times \frac{1.25 \text{ mol } Na_2O}{1 \text{ L}} = 0.625 \text{ M } Na_2O$$

$$25.) 0.500 \text{ L } MgF_2 \times \frac{1.25 \text{ mol } MgF_2}{1 \text{ L}} = 0.625 \text{ M } MgF_2$$

$$26.) 0.100 \text{ L } Ca(NO_3)_2 \times \frac{1.10 \text{ mol } Ca(NO_3)_2}{1 \text{ L}} = 0.110 \text{ M } Ca(NO_3)_2$$

$$27.) 2.2 \text{ mol } H_2 \times \frac{22.4 \text{ L } H_2}{1 \text{ mol}} = 49. \text{ L } H_2$$

$$28.) 0.0665 \text{ mol } O_2 \times \frac{22.4 \text{ L } O_2}{1 \text{ mol}} = 1.49 \text{ L } O_2$$

$$29.) 30.7 \text{ mol } SO_2 \times \frac{22.4 \text{ L } SO_2}{1 \text{ mol}} = 688 \text{ L } SO_2$$

$$30.) 50.0 \text{ L } O_2 \times \frac{1 \text{ mol } O_2}{22.4 \text{ L}} = 2.23 \text{ mol } O_2$$

$$31.) 2.75 \text{ L } Cl_2 \times \frac{1 \text{ mol } Cl_2}{22.4 \text{ L}} = 0.123 \text{ mol } Cl_2$$

$$32.) 1.000 \text{ L } CO_2 \times \frac{1 \text{ mol } CO_2}{22.4 \text{ L}} = 0.04464 \text{ mol } CO_2$$

$$33.) \frac{50.0 \text{ g } NaOH}{1.2 \text{ L}} \times \frac{1 \text{ mol } NaOH}{40.00 \text{ g } NaOH} = 1.04 \text{ M } NaOH$$

$$34.) \frac{100. \text{ g } Mg(NO_3)_2}{0.500 \text{ L}} \times \frac{1 \text{ mol } Mg(NO_3)_2}{148.33 \text{ g } Mg(NO_3)_2} = 1.35 \text{ M } Mg(NO_3)_2$$

$$35.) \frac{75.45 \text{ g } CaSO_4}{0.300 \text{ L}} \times \frac{1 \text{ mol } CaSO_4}{136.14 \text{ g } CaSO_4} = 1.85 \text{ M } CaSO_4$$

$$36.) \frac{10.1 \text{ g } NaClO_2}{0.100 \text{ L}} \times \frac{1 \text{ mol } NaClO_2}{90.44 \text{ g } NaClO_2} = 1.12 \text{ M } NaClO_2$$

$$37.) \frac{0.400 \text{ mol } NaCO_3}{1.2 \text{ L}} \times \frac{83.0 \text{ g } NaCO_3}{1 \text{ mol}} = \frac{28 \text{ g } NaCO_3}{1 \text{ L}}$$

$$38.) \frac{1.35 \text{ mol } Fe(NO_3)_3}{0.450 \text{ L}} \times \frac{241.88 \text{ g } Fe(NO_3)_3}{1 \text{ mol}} = \frac{725 \text{ g } Fe(NO_3)_3}{1 \text{ L}}$$

$$39.) \frac{0.095 \text{ mol } CuSO_4}{0.250 \text{ L}} \times \frac{159.61 \text{ g } CuSO_4}{1 \text{ mol}} = \frac{61 \text{ g } CuSO_4}{1 \text{ L}}$$

$$40.) \frac{1.15 \text{ mol } Zn(NO_3)_2}{5.00 \text{ L}} \times \frac{189.41 \text{ g } Zn(NO_3)_2}{1 \text{ mol}} = \frac{43.6 \text{ g } Zn(NO_3)_2}{1 \text{ L}}$$

$$41.) 45.25 \text{ L } CO_2 \times \frac{1 \text{ mol } CO_2}{22.4 \text{ L}} \times \frac{44.01 \text{ g } CO_2}{1 \text{ mol}} = 88.9 \text{ g } CO_2$$

$$42.) 2.8 \text{ L } CS_2 \times \frac{1 \text{ mol } CS_2}{22.4 \text{ L}} \times \frac{76.13 \text{ g } CS_2}{1 \text{ mol}} = 9.5 \text{ g } CS_2$$

$$43.) 50.0 \text{ L } N_2 \times \frac{1 \text{ mol } N_2}{22.4 \text{ L}} \times \frac{28.02 \text{ g } N_2}{1 \text{ mol}} = 62.5 \text{ g } N_2$$

$$44.) 2000. \text{ L } CO \times \frac{1 \text{ mol } CO}{22.4 \text{ L}} \times \frac{28.01 \text{ g } CO}{1 \text{ mol}} = 2.50 \times 10^3 \text{ g } CO$$

$$45.) 50.0 \text{ g } O_2 \times \frac{1 \text{ mol } O_2}{32.00 \text{ g}} \times \frac{22.4 \text{ L } O_2}{1 \text{ mol}} = 35.0 \text{ L } O_2$$

$$46.) 3.50 \text{ kg } Ar \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol } Ar}{39.95 \text{ g}} \times \frac{22.4 \text{ L } Ar}{1 \text{ mol}} = 1960 \text{ L } Ar$$

$$47.) 700. \text{ g } N_2O \times \frac{1 \text{ mol } N_2O}{44.02 \text{ g}} \times \frac{22.4 \text{ L } N_2O}{1 \text{ mol}} = 356 \text{ L } N_2O$$

$$48.) 500. \text{ g } SO_3 \times \frac{1 \text{ mol } SO_3}{80.06 \text{ g}} \times \frac{22.4 \text{ L } SO_3}{1 \text{ mol}} = 140. \text{ L } SO_3$$

$$49.) 50.0 \text{ L } CO_2 \times \frac{1 \text{ mol } CO_2}{22.4 \text{ L}} \times \frac{6.022 \times 10^{23} \text{ } CO_2}{1 \text{ mol}} = 1.34 \times 10^{24} \text{ } CO_2$$

$$50.) 50.0 \text{ L } CO_2 \times \frac{1 \text{ mol } CO_2}{22.4 \text{ L}} \times \frac{6.022 \times 10^{23} \text{ } CO_2}{1 \text{ mol}} \times \frac{2 \text{ atoms } O}{1 \text{ molec } CO_2} = 2.69 \times 10^{24} \text{ } CO_2$$