Moles, Liters, Grams and Atoms

1) 0.500 mol of Al = 3 x 10^{23} Al atoms.

2) 1.50 mol H_2O = 9 x 10^{23} H_2O molecules.

3) 12 X 10^{23} H_2 molecules = 2 mole H_2.

4) 12 X 10^{24} H_2 molecules = 20 mole H_2.

5) 18 X 10^{23} O_2 molecules = 3 mole O_2.

6) 4.50 mole CO_2 = 27 x 10^{23} CO_2 molecules.

7) 1 mole H_2O molecules = 3 moles of atoms.

8) 2 moles CH_4 molecules = 10 moles of atoms.

9) 2 moles $C_6H_{12}O_6$= 12 moles of C, 24 moles of H, and 12 moles of O.

10) 0.50 mole $Ca(OH)_2$= 0.50 mole Ca, 1.0 mole O, and 1.0 mole H.

For problems 11 through 28, use the following information:

$CaCO_3$ = 100.0 g/mol	SiO_2 = 60.0	H_3PO_4 = 98.0 g/mol
H_2 = 2.0 g/mol	N_2O_5 = 108.0 g/mol	C_3H_8O = 60.0 g/mol

CH_4 = 16.0 g/mol	$(NH_4)_2SO_4$ = 132 g/mol	

11) 10.0 g H_2 = 5.00 mol H2	12) 5.89 g Co = 0.100 mol Co
13) 600 g SiO_2 = 10.0 mol SiO2	14) 2.00 mol SiO_2 = 120 g SiO_2
15) 2.00 mol N_2O_5 = 216 g N2O5	16) 0.500 mol H_3PO_4 = 49.0 g H_3PO_4
17) 5.0 g H_2 = 2.5 mol H2	18) 3.2 mol H_2 = 6.4 g H_2
19) 1.32 g $(NH_4)_2SO_4$ = 0.0100 mol	20) 2.50 mol C_3H_8O = 150 g C_3H_8O
21) 11.2 L N_2 @ STP = 0.500 mol	22) 11.2 L CH_4 @ STP = .500 mol CH_4
23) 112 L O_2 @ STP = 5.00 mol	24) 44.8 L O_2 @ STP = 2.00 mol O_2
25) 0.500 mol H_2 @ STP = 11.2 L	26) 10.0 mol N_2 @ STP = 224 L
27) 0.100 mol Cl_2 @ STP = 2.24 L	28) 0.200 mol F_2 @ STP = 4.48 L

29) 0.500 mol CH_4 = 8.00 g CH_4 = 11.2 L CH_4 @ STP

30) 12 X 10^{23} O_2 = 2.0 mol O_2 = 64 g O_2 = 44.8 L O_2 @ STP

31) 3.00 mol N_2 = 18 x 10^{23} N_2 molecules = 84 g N_2 = 67.2 L N_2 @ STP

32) 2.24 L He @ STP = 0.100 mol He = 6 x 10^{22} He atoms = .40 g He

33) 120.0 g NaOH = 3.00 mol NaOH = 18 x 10^{23} NaOH formula units

34) 110.0 g CO_2 = 2.50 mol CO_2 = 15 x 10^{23} CO_2 molecules = 56.0 L @ STP

35) 35.5 g Cl_2 = 0.500 mol Cl_2 = 11.2 L @ STP = 3 x 10^{23} Cl_2 molecules

36) 1.60 g CH_4 = 0.100 mol CH_4 = 2.24 L @ STP = 6 x 10^{22} CH_4 molecules

37) 44.8 L @ STP CH_4 = 2.00 mol CH_4 = 32.0 g CH_4 =12 x 10^{23} CH_4 molecules

38) 448 L @ STP CO_2 = 880 g CO_2 = 1.2 x 10^{25} CO_2 molecules

39) 12 X 10^{23} NaOH molecules = 80.0 g NaOH = 2.00 mol NaOH

40) 24 X 10^{23} H2 = 8.0 g H_2 = 89.6 L H_2 @ STP

41) 1.5 X 10^{23} CO_2 = 11.0 g CO_2 = 5.6 L CO_2 @ STP

42) 1.0 g H_2 = 11.2 L H_2 @ STP = 3 x10^{23} H_2 molecules