1. $$\frac{100.0 \text{ mL}}{} \left|\, \frac{1 \text{ liter}}{1000 \text{ mL}} \,\right| \frac{1.2 \text{ mol CuCl}}{1 \text{ liter}} \left|\, \frac{6.02 \times 10^{23} \text{ CuCl}}{1 \text{ mol CuCl}} \,\right| \frac{1 \text{ Cl}}{1 \text{ CuCl}}$$

$$= 7.2 \times 10^{22} \text{ Cl}$$

2. $$\frac{25 \text{ g } C_{12}H_{22}O_{11}}{200.0 \text{ cm}^3} \left|\, \frac{1000 \text{ cm}^3}{1 \text{ liter}} \,\right| \frac{1 \text{ mol } C_{12}H_{22}O_{11}}{342.0 \text{g } C_{12}H_{22}O_{11}} = 0.37 \text{ M } C_{12}H_{22}O_{11}$$

3. $$\frac{150 \text{g KMnO}_4}{} \left|\, \frac{1 \text{ mol KMnO}_4}{158.0 \text{g KMnO}_4} \,\right| \frac{1 \text{ mol K}}{1 \text{ mol KMnO}_4} \left|\, \frac{39.1 \text{ g K}}{1 \text{ mol K}} \,\right| = 37 \text{ g K}$$

4. $$\frac{1.79 \text{ g CH}_4}{} \left|\, \frac{1 \text{ mol CH}_4}{16.0 \text{ g CH}_4} \,\right| \frac{22.4 \text{ L CH}_4}{1 \text{ mol CH}_4} = 2.51 \text{ L CH}_4$$

5. $$\frac{1.0 \text{ g NaCl}}{25 \text{ cm}^3} \left|\, \frac{1000 \text{ cm}^3}{1 \text{ liter}} \,\right| \frac{1 \text{ mol NaCl}}{58.5 \text{g NaCl}} = 0.68 \text{ M NaCl}$$

6. $$\frac{9.2 \times 10^{23} \text{ Hg}}{} \left|\, \frac{1 \text{ mol Hg}}{6.02 \times 10^{23} \text{ g Hg}} \,\right| = 1.5 \text{ mol Hg}$$

7. $\dfrac{0.39 \text{ mol Zn}}{} \left| \dfrac{65.4 \text{ g Zn}}{1 \text{ mol Zn}} \right. = 26 \text{ g Zn}$

8. $\dfrac{75 \text{ g NaCl}}{} \left| \dfrac{1 \text{ mol NaCl}}{58.5 \text{ g NaCl}} \right| \dfrac{6.02 \text{ x } 10^{23} \text{ NaCl}}{1 \text{ mol NaCl}} = 7.7 \text{ x } 10^{23} \text{ NaCl}$

9. $\dfrac{25.0 \text{ g CuSO}_4}{1.1 \text{ dm}^3} \left| \dfrac{1 \text{ mol CuSO}_4}{159.6 \text{ g CuSO}_4} \right. = 0.14 \text{ M CuSO}_4$

10. $\dfrac{75.0 \text{ ml}}{} \left| \dfrac{1 \text{ liter}}{1000 \text{ ml}} \right| \dfrac{0.67 \text{ mol Ca}_3(\text{PO}_4)_2}{1 \text{ liter}} \left| \dfrac{310.3 \text{ g Ca}_3(\text{PO}_4)_2}{1 \text{ mol Ca}_3(\text{PO}_4)_2} \right.$

$= 16 \text{ g Ca}_3(\text{PO}_4)_2$

11. $\dfrac{2.68 \text{ g Na}_2\text{S}}{} \left| \dfrac{1 \text{ mol Na}_2\text{S}}{78.1 \text{ g Na}_2\text{S}} \right| \dfrac{6.02 \text{ x } 10^{23} \text{ Na}_2\text{S}}{1 \text{ mol Na}_2\text{S}} \left| \dfrac{2 \text{ Na}}{1 \text{ Na}_2\text{S}} \right.$

$= 4.13 \text{ x } 10^{22} \text{ Na}$

12. $\frac{100.0\text{g CH}_3\text{OH}}{} \left| \frac{1 \text{ mol CH}_3\text{OH}}{32.04\text{g CH}_3\text{OH}} \right| \frac{1 \text{ mol O}}{1 \text{ mol CH}_3\text{OH}} \left| \frac{22.4 \text{ L O}}{1 \text{ mol O}} \right.$

$$= 69.9 \text{ L oxygen}$$

13. $\frac{4.49 \times 10^{22} \text{ CuCl}_2}{} \left| \frac{1 \text{ mol CuCl}_2}{6.02 \times 10^{23} \text{ CuCl}_2} \right| \frac{134.5 \text{ g CuCl}_2}{1 \text{ mol CuCl}_2} = 10.0 \text{ CuCl}_2$

14. $\frac{3.5\text{g PbO}_2}{75 \text{ cm}^3} \left| \frac{1 \text{ mol PbO}_2}{239.2 \text{ g PbO}_2} \right| \frac{1000 \text{ cm}^3}{1 \text{ liter}} = 0.20 \text{ M PbO}_2$

15. $\frac{349.66 \text{ g Pb}}{} \left| \frac{1 \text{ mol Pb}}{207.2 \text{ g Pb}} \right| \frac{6.02 \times 10^{23} \text{ Pb}}{1 \text{ mol Pb}} = 1.02 \times 10^{24} \text{ Pb}$

4. $$\frac{1.79\text{g CH}_4}{16.0\text{g CH}_4} \cdot \frac{1 \text{ mol CH}_4}{} \cdot \frac{6.02 \times 10^{23} \text{ CH}_4}{1 \text{ mol CH}_4} = 6.73 \times 10^{22} \text{ CH}_4$$

12. $$\frac{100.0\text{g CH}_3\text{OH}}{} \cdot \frac{1 \text{ mol CH}_3\text{OH}}{32.04\text{g CH}_3\text{OH}} \cdot \frac{1 \text{ mol O}}{1 \text{ mol CH}_3\text{OH}} \cdot \frac{16.00 \text{ O}}{1 \text{ mol O}}$$

$$49.94\text{g O}$$