1. $\dfrac{100.0 \text{ g CH}_3\text{OH}}{} \left| \dfrac{1 \text{ mol CH}_3\text{OH}}{32.0 \text{ g CH}_3\text{OH}} \right| \dfrac{6.02 \times 10^{23} \text{ CH}_3\text{OH}}{1 \text{ mol CH}_3\text{OH}} \left| \dfrac{4 \text{ H}}{1 \text{ CH}_3\text{OH}} \right. = 7.53 \times 10^{24} \text{ H}$

2. $\dfrac{0.10 \text{ mol O}_2}{} \left| \dfrac{6.02 \times 10^{23} \text{ O}_2}{1 \text{ mol O}_2} \right| \dfrac{2 \text{ O}}{1 \text{ O}_2} = 1.2 \times 10^{23} \text{ O}$

3. $\dfrac{25.0 \text{ ml H}_2\text{O}}{} \left| \dfrac{1 \text{ g H}_2\text{O}}{1 \text{ ml H}_2\text{O}} \right| \dfrac{1 \text{ mol H}_2\text{O}}{18.0 \text{ g H}_2\text{O}} \left| \dfrac{6.02 \times 10^{23} \text{ H}_2\text{O}}{1 \text{ mol H}_2\text{O}} \right. = 8.36 \times 10^{23} \text{ H}_2\text{O}$

4. $\dfrac{25 \text{ g C}_{12}\text{H}_{22}\text{O}_{11}}{} \left| \dfrac{1 \text{ mol C}_{12}\text{H}_{22}\text{O}_{11}}{342.0 \text{ g C}_{12}\text{H}_{22}\text{O}_{11}} \right. = 0.073 \text{ mol C}_{12}\text{H}_{22}\text{O}_{11}$

5. $\dfrac{2.1 \text{ mol Hg}}{} \left| \dfrac{200.6 \text{ g Hg}}{1 \text{ mol Hg}} \right. = 420 \text{ g Hg}$

6. $\dfrac{3.5 \text{ g PbO}_2}{} \left| \dfrac{1 \text{ mol PbO}_2}{239.2 \text{ g PbO}_2} \right| \dfrac{6.02 \times 10^{23} \text{ PbO}_2}{1 \text{ mol PbO}_2} \left| \dfrac{1 \text{ Pb}}{1 \text{ PbO}_2} \right. = 8.8 \times 10^{21} \text{ Pb}$

7. $\dfrac{1.23 \times 10^{24}\ CuSO_4}{} \left| \dfrac{1\ mol\ CuSO_4}{6.02 \times 10^{23}\ CuSO_4} \right| \dfrac{159.6\ g\ CuSO_4}{1\ mol\ CuSO_4} = 326\ g\ CuSO_4$

8. $\dfrac{150\ g\ KMnO_4}{} \left| \dfrac{1\ mol\ KMnO_4}{158.0\ g\ KMnO_4} \right| \dfrac{6.02 \times 10^{23}\ KMnO_4}{1\ mol\ KMnO_4} = 5.7 \times 10^{23}\ KMnO_4$

9. $\dfrac{20.4\ cm\ Cu}{} \left| \dfrac{0.12\ g\ Cu}{1\ cm\ Cu} \right| \dfrac{1\ mol\ Cu}{63.5\ g\ Cu} \left| \dfrac{6.02 \times 10^{23}\ Cu}{1\ mol\ Cu} \right. = 2.3 \times 10^{22}\ Cu$

10. $\dfrac{75\ g\ NaCl}{} \left| \dfrac{1\ mol\ NaCl}{58.5\ g\ NaCl} \right| \dfrac{6.02 \times 10^{23}\ NaCl}{1\ mol\ NaCl} \left| \dfrac{2\ atoms}{1\ NaCl} \right. = 1.5 \times 10^{24}\ atoms$

11. $\dfrac{1.8\ g\ (NH_4)_2Cr_2O_7}{} \left| \dfrac{1\ mol\ (NH_4)_2Cr_2O_7}{252.0\ g\ (NH_4)_2Cr_2O_7} \right. = 0.0071\ mol\ (NH_4)_2Cr_2O_7$

12. $\dfrac{1.5\ g\ I_2}{} \left| \dfrac{1\ mol\ I_2}{253.8\ g\ I_2} \right| \dfrac{2\ mol\ I}{1\ mol\ I_2} = 0.012\ mol\ I$

13. $\dfrac{1.35 \text{ mol Zn}}{} \Bigg| \dfrac{6.02 \times 10^{23} \text{ Zn}}{1 \text{ mol Zn}} = 8.13 \times 10^{23} \text{ Zn}$

14. $\dfrac{2.68 \text{ g Na}_2\text{S}}{} \Bigg| \dfrac{1 \text{ mol Na}_2\text{S}}{78.1 \text{ g Na}_2\text{S}} \Bigg| \dfrac{6.02 \times 10^{23} \text{ Na}_2\text{S}}{1 \text{ mol Na}_2\text{S}} \Bigg| \dfrac{2 \text{ Na}}{1 \text{ Na}_2\text{S}} = 4.13 \times 10^{24} \text{ Na}$

15. $\dfrac{348.84 \text{ Pb}}{} \Bigg| \dfrac{1 \text{ mol Pb}}{207.2 \text{ g Pb}} \Bigg| \dfrac{6.02 \times 10^{23} \text{ Pb}}{1 \text{ mol Pb}} = 1.01 \times 10^{24} \text{ Pb}$