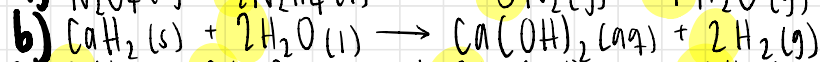
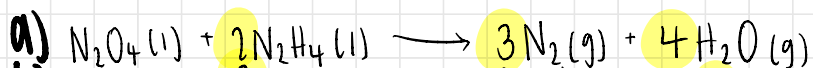


5.56: balance each redox reactions:



6.20: what is a mole of a substance? How many moles are in 1 mol of a molecular compound?

- mole = an amount equal to its formula weight in grams
- 1 mol of a molecular compound = 6.022×10^{23} molecules

6.24: How many calcium atoms are in 16.2 g of calcium?

$$16.2 \text{ g of Ca} \times \frac{1 \text{ mol Ca}}{40.08 \text{ g Ca}} \times \frac{6.022 \times 10^{23} \text{ atoms Ca}}{1 \text{ mol Ca}} = 2.43 \times 10^{23} \text{ atoms Ca}$$

6.29: caffeine = $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$. If an average cup of coffee contains $\approx 125 \text{ mg}$ of caffeine, how many moles of caffeine are in 1 cup?

$$125 \text{ mg of caffeine} \times \frac{1 \text{ g of caffeine}}{1000 \text{ mg of caffeine}} = .125 \text{ g of caffeine}$$

$$\left. \begin{array}{l} \text{C}_8 = 12.01 \times 8 = 96.08 \\ \text{H}_{10} = 1.008 \times 10 = 10.08 \\ \text{N}_4 = 14.0067 \times 4 = 56.0268 \\ \text{O}_2 = 15.9994 \times 2 = 31.9988 \end{array} \right\} +$$

$$\frac{194.1856}{194.9}$$

$$.125 \text{ g of caffeine} \times \frac{1 \text{ mol caff.}}{194.9 \text{ g caff.}} = 6.44 \times 10^{-4} \text{ moles of caffeine}$$