55b) % mass 'H which can be attributed to the electron

\[ \frac{\text{Mass } e^-}{\text{Total Mass}} = \frac{5.486 \times 10^{-4} \text{ amu}}{1.0078 \text{ amu}} = 0.05444\% \]

**Problem 68**

a) Calcium sulfide $\rightarrow$ CaS
   Calcium hydrogen sulfide $\rightarrow$ Ca(HS)_2

b) Hydrobromic acid $\rightarrow$ HBr
   Bromic acid $\rightarrow$ HBrO_3

c) Aluminum nitride $\rightarrow$ AlN
   Aluminum nitrite $\rightarrow$ Al(NO_2)_3

d) Iron (II) oxide $\rightarrow$ FeO
   Iron (III) oxide $\rightarrow$ Fe_2O_3

**Problem 73**

a) All of the α-particles would be expected to have passed through the gold foil with very little change in their momentum (velocity and direction).

b) That almost all of the mass of an atom (the protons and neutrons) is concentrated in a very small region of the atom (the nucleus).

**Problem 74**

a) γ-rays are not particles, they are highly energetic electromagnetic radiation (light).

b) A beta particle is an electron, its mass is $5.486 \times 10^{-4}$ amu. An alpha particle is a $^4$He nucleus (2 protons + 2 neutrons) its mass is 4.00 amu. So that alpha particles are

\[ \frac{4.00 \text{ amu}}{5.486 \times 10^{-4} \text{ amu}} = 7300 \text{ times more massive than } \beta\text{-particles} \]

The charge of each particle (α-particle = +2, β-particle = -1) will also influence the magnitude of the deflection.