

Problem 1.1

How much charge is represented by these number of electrons?

- (a) 6.482×10^{17}
- (b) 1.24×10^{18}
- (c) 2.46×10^{19}
- (d) 1.628×10^{20}

Solution

Use the fact that there are about 6.24×10^{18} electrons in -1 coulomb of charge.

$$(a) \quad 6.482 \times 10^{17} \text{ electrons} \times \frac{-1 \cancel{\text{C}}}{6.24 \times 10^{18} \text{ electrons}} \times \frac{1000 \text{ mC}}{1 \cancel{\text{C}}} \approx -104 \text{ mC}$$

$$(b) \quad 1.24 \times 10^{18} \text{ electrons} \times \frac{-1 \cancel{\text{C}}}{6.24 \times 10^{18} \text{ electrons}} \times \frac{1000 \text{ mC}}{1 \cancel{\text{C}}} \approx -199 \text{ mC}$$

$$(c) \quad 2.46 \times 10^{19} \text{ electrons} \times \frac{-1 \text{ C}}{6.24 \times 10^{18} \text{ electrons}} \approx -3.94 \text{ C}$$

$$(d) \quad 1.628 \times 10^{20} \text{ electrons} \times \frac{-1 \text{ C}}{6.24 \times 10^{18} \text{ electrons}} \approx -26.1 \text{ C}$$