

Quiz 1.2 – Measurements and Numbers

Name: Kery

Question 1

Give the total number of significant figures and the position of the least significant digit in each quantity"

| | | | | |
|---------------------|--|---------------------|--------------------|--|
| <u>1.250</u> g | <u>6.022</u> × 10 ²³ | <u>0.00215</u> L | <u>3500</u> km | <u>2.590</u> × 10 ⁻⁷ m |
| 4, 10 ⁻³ | 4, 10 ⁻³ (10 ⁻²⁰) | 3, 10 ⁻⁵ | 2, 10 ² | 4, 10 ⁻³ (10 ⁻¹⁰) |

Question 2

Give the solution to each expression with the proper number of significant figures

$x = 23.14 \text{ cm} + 4.105 \text{ cm}$

27.25 cm

$x = \frac{0.12 \text{ mol}}{1.53 \text{ L}}$

$0.078 \frac{\text{mol}}{\text{L}}$

$x = 94 \mu\text{s} - 8.7 \times 10^{-5} \text{ s}$

$7 \cdot 10^{-6} \text{ s}$

$x = \frac{12.4 \text{ g} + 1.94 \text{ g}}{20.4 \text{ cm}^3 - 3.47 \text{ cm}^3}$

$\frac{14.34 \text{ g}}{16.93 \text{ cm}^3}$

0.847 g/cm^3

Question 3

Later in this course we will use the following equation: $v_{rms} = \sqrt{\frac{3RT}{M}}$ Find the units of v_{rms} if R has units $\frac{\text{J}}{\text{mol K}}$, T has units K , M has units $\frac{\text{kg}}{\text{mol}}$, and $J \equiv \frac{\text{kg m}^2}{\text{s}^2}$

$$\left(\frac{\frac{\text{J}}{\text{mol} \cdot \text{K}} \cdot \text{K}}{\frac{\text{kg}}{\text{mol}}} \right)^{1/2} = \left(\frac{\text{J}}{\text{kg}} \right)^{1/2} = \left(\frac{\frac{\text{kg m}^2}{\text{s}^2}}{\text{kg}} \right)^{1/2} = \left(\frac{\text{m}^2}{\text{s}^2} \right)^{1/2} = \text{m/s}$$

Question 4

Complete the following table:

| Decimal Quantity | Scientific Notation | Prefix Notation |
|------------------------|--------------------------------|-----------------------------|
| 0.0045 m | <u>4.5 · 10⁻³ m</u> | <u>4.5 mm</u> |
| <u>36,000,000 m</u> | <u>3.6 · 10⁷ m</u> | 36 Mm |
| <u>0.000 000 560 m</u> | 5.60 × 10 ⁻⁷ m | <u>560 nm -or- 0.560 μm</u> |