

Significant Figures

Exercises

How many significant figures?

- 0.0004 ml 1, leading zeros are never good
- 3.0005 g 5, sandwiched zeros are always significant
- 900 kg 1, trailing zeros are not significant when there's no decimal
900. Kg 3; it's the same as 9.00×10^2
- 2.00 g 3
- 0.02000 g 2.000×10^{-2} so 4 SF
- 1.0030 g 5
- 2.90×10^{-3} g 3

9. a) Read the thermometer and report the measurement with the correct number of sig figs.

22.5 °C.

- b) What if the line was right on the zero?

0.0 °C

Apply the rules of sig figs for the following problems:

10. If 0.010 g of mass are destroyed in a fission reaction, how much energy will be released?
 $c = 3.00 \times 10^8$ m / s

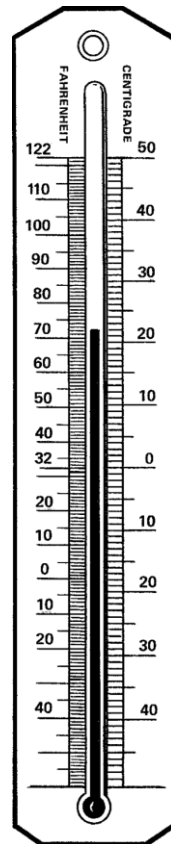
$$0.010 \text{ g} = 0.000010 \text{ kg (2 SF)}$$

$$E = mc^2 = 0.000010 \text{ kg } (3.00 \times 10^8 \text{ m / s})^2 = 9.0 \times 10^{11} \text{ J (2 SF like the measurement with the least SF)}$$

11. The molar mass of Cl is 35.45 g/mole. What is the mass of 3.001 moles of Cl₂?

$$\text{Cl}_2 = 2 \times 35.45 \text{ g/mole} = 70.90 \text{ g/mole}$$

$$3.001 \text{ moles of Cl}_2 (70.90 \text{ g/mole}) = 212.8 \text{ g (4 SF)}$$



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12. Convert 1.0×10^{-4} mol/L of NaOH to ppm.

$$1.0 \times 10^{-4} \text{ mol/L} * 40.0 \text{ g/mol} = 4.0 \times 10^{-3} \text{ g/L} = 4.0 \text{ mg/L} = 4.0 \text{ ppm (2 SF)}$$

13. a) Find the sum of 1.00797 and 0.00001 with the correct number of sig figs.

b) Find the product of 1.00797 and 0.00001 with the correct number of sig figs.

a) When there's no multiplication or division, we go by rule #9, which is based on decimals (least number)

$1.00797 + 0.00001 = 1.00798$ g/mole, five decimals. If there was multiplication or division, the answer would have had only 1 SF.

b) 1×10^{-5} , 1 SF only