

Error analysis

Sam made mistakes. Find them, fix them, explain them.



NAME _____ CLASS _____ DATE _____

LEARNING GOAL

Find, correct and explain mistakes in chemistry calculations.

SUCCESS CRITERIA

- ☐ I can spot a mistake in a calculation.
- ☐ I can write the correct working.
- ☐ I can explain the mistake in a sentence.

Data strip: relative atomic mass, A_r

H	C	N	O	Na	Cl
hydrogen	carbon	nitrogen	oxygen	sodium	chlorine
1	12	14	16	23	35.5

amount (mol) = mass (g) / molar mass (g/mol)
Relative formula mass, M_r , has no unit.

HOW TO SPOT AN ERROR

- ☐ Units: is every answer written with its unit?
- ☐ M_r added up: is every atom counted?
- ☐ Equation: amount = mass / molar mass.
- ☐ Balanced equation: did I use the ratio?
- ☐ Odd result? Retain it; investigate and repeat.

ENTRY

1

Sam finds the moles in 36 g of water, H_2O .



STUDENT'S ANSWER

$$M_r = 1 + 16 = 17$$

$$\text{moles} = 36 \div 17 = 2.1 \text{ mol}$$

FIX

My correct working

The mistake was ... because ...

My correct working

The mistake was ... because ...

ENTRY

2

Sam finds the moles in 88 g of carbon dioxide, CO_2 .



STUDENT'S ANSWER

$$M_r = 12 + 16 = 28$$

$$\text{moles} = 88 \div 28 = 3.14 \text{ mol}$$

FIX

My correct working

The mistake was ... because ...

Find and fix more



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ENTRY 3

Sam finds the mass of
0.5 mol of sodium
chloride, NaCl.

⊗ STUDENT'S ANSWER

$M_r = 23 + 35.5 = 58.5$
mass = moles $\div$ M_r
 $= 0.5 \div 58.5 = 0.0085 \text{ g}$

FIX

My correct working

The mistake was ... because ...

ENTRY 4

The equation is $2\text{H}_2 + \text{O}_2$
 $\rightarrow 2\text{H}_2\text{O}$.

⊗ STUDENT'S ANSWER

"4 mol of H_2 makes 2 mol of H_2O
because there is a 2 in front."

FIX

My correct working

The mistake was ... because ...

ENTRY 5

Four repeats of a
reaction. Temperature
rise in $^{\circ}\text{C}$.

⊗ STUDENT'S ANSWER

mean = $(5.0 + 5.2 + 9.8 + 5.1) \div 4$
 $= 6.3^{\circ}\text{C}$

FIX

My correct working

This mean may be correct. Check it, then
discuss the unusual result.

The mistake was ... because ...

ENTRY 6

Make a mistake for a partner

You must know the right answer

My one-line calculation, with one planted error

SWAP

My partner's correction

The right answer is (cover when you swap):

☐ Not yet ☐ Getting there ☒ Got it