

Quantitative chemistry

Mark scheme

1.	(a)	water		1
			<i>accept H₂O or 5H₂O</i>	
			2 must be below halfway	
	(b)	the cold water / ice / cubes (owtte)		1
			<i>accept 'cooled down' or references to cold</i>	
	(c)	reversible reaction		1
	(d)	(i)	0.87g	1
		(ii)	the student made errors in weighing during the experiments	1
			the student did not heat the copper sulfate for long enough in one of the experiments	1
				[6]
2.	(a)	157	<i>correct answer with or without working (2 × 19 + 119) for 1 mark only allow (119 + 19 =) 138 for 1 mark only ignore units</i>	2
	(b)	24.2	<i>accept answers in the range 24 to 24.2038..... ignore incorrect rounding after correct answer 25 only without working gains 1 mark or 38/157 × 100 gains 1 mark or (19/157 × 100 =) <u>12 to 12.1</u> gains 1 mark allow error carried forward from part(a) 38/(a) × 100 gains 2 marks if calculated correctly (19/138 × 100 =) <u>13.8</u> gains 1 mark</i>	2
	(c)	0.29	<i>accept answers in the range 0.28 to 0.3 allow error carried forward from part (b) (b)/100 × 1.2 correctly calculated ignore units</i>	1
				[5]

C2.3.3 Mark Scheme

3. 168g → 44g 1

1g → $\frac{44}{168}$ 1

11g → 2.88g (2.9g) 1
care with rounding

or Mr values 84 and 44 (1)

moles hydrogen carb = $\frac{11}{84} = 0.13$ (1)

mass of CO₂ = $\frac{0.13}{2} \times 44 = \underline{2.9g}$ (1)

*answer 2.88 to 2.9 gets 3 marks
answer of 3 gets 2 marks*

[3]

4. Pb Cl C O

$\frac{76}{207}$ $\frac{13}{35.5}$ $\frac{2.2}{12}$ $\frac{8.81}{16}$

*1 mark for dividing **one** mass by A_r
allow upside down ratio to lose this mark only*

= 0.367 = 0.366 = 0.183 = 0.55 1

*1 mark for **one** correct proportion – accept to one d.p. or rounded up to 1 d.p.*

*1 mark for **all four** correct proportions correctly rounded* 1

2 2 1 3 1

or Pb₂Cl₂CO₃

*1 mark for correctly written formula **or** correct whole number ratio
correct formula without working gets only 1 mark.*

*e.c.f. can be allowed from incorrect proportions to formula **or** ratio*

[4]