01. 0620_s13_ms_62 Q: 2

(a) black (1) [1]

(b) **(i)** copper / Cu (1)

(ii) water / H_2O (1) **accept:** steam [2]

(c) boiling point / freezing point (1)

100 °C / 0 °C (1)
note: do not accept a chemical test [2]

(a) table of results for Experiment 1

final and initial volumes and difference completed correctly 26.00, 0.0 and 26.0 (1)

to 1 decimal place (1) **accept:** volumes to 2 d.p. (e.g. 26.00) [2]

(b) table of results for Experiment 2

final and initial volumes and difference completed correctly 19.0 and 32.0 (1) 13.0 (1) [2]
ignore: decimal places, **accept:** 19, 32,13, **allow:** ecf on final and initial volumes

(c) **(i)** colourless **not:** clear to purple / pink (1) [1]
accept: colour change either way round

(ii) not an acid / alkali reaction or potassium manganate is coloured or pink / acts as an indicator / there is already a colour change / owtte (1) [1]

(d) **(i)** experiment 1 (1) **allow:** ecf on **(a)** and **(b)** [1]

(ii) experiment 1 is twice the volume of experiment 2 / experiment 2 is half the volume of experiment 1 (1) **note:** must be a quantitative comparison, do not allow quotes of figures from table **allow:** ecf (e.g. 13 times as much as experiment 2) [1]

(iii) solution B / experiment 1 more concentrated / stronger (1) or converse

double / twice (1) [2]
ignore: reference to reactivity

(e) half value from table result for experiment 2 (6.5) (1) **allow:** ecf

cm^3 (1)

half volume of **C** used (1) [3]

(f) oxidation (1) reduction (1)

or: electrons are lost (1) gained (1) transferred (2) [2]
accept: oxidation numbers increase (1) decrease (1)
accept: hydrogen / H_2 / H lost (1) gained (1)
accept: oxygen / O_2 / O gained (1) lost (1)

(g) advantage easy to use / quick / convenient (1) **ignore:** large volumes

disadvantage not accurate / owtte (1) [2]

03. 0620_s15_ms_63 Q: 3

(a)	brown / red-brown / orange;	1	**A** black
(b)(i)	oxygen / air used up / reacted;	1	
(b)(ii)	150 – 125 = 25; 25 / 150 × 100 = 16.7%;	2	
(c)	same results;	1	

04. 0620_s20_ms_62 Q: 1

Question	Answer	Marks
(a)	arrow under copper(II) oxide pointing up to the copper(II) oxide	1
(b)	start: black final: brown	1
(c)	water	1
(d)	to cool	1
	so that the steam / gas condenses / turns into a liquid	1
(e)(i)	flammable / explosive	1
(e)(ii)	method of collection shown would work	1
	collection apparatus is graduated	1

05. 0620_w12_ms_61 Q: 1

(a) arrow under copper oxide (1) [1]

(b) black (1) to brown/red (1) [2]

(c) diagram of tube entering test-tube or similar in beaker of cold water/ice/Liebig condenser (1) [2]

labelled water/ice/condenser (1)

(d) extinguished/goes out (1) **not:** no effect/no reaction [1]