Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Mark Schemes

Q1.

(a) **M1** $AgNO_3$ OR silver nitrate OR any soluble silver salt

M2 remains colourless or no reaction or no (observed) change or no precipitate

M3 white precipitate or white solid/white suspension

An insoluble silver salt OR Tollens' OR ammoniacal silver nitrate or HCl/$AgNO_3$ is CE = 0 for the clip

For M1

Credit acidified (or HNO_3) silver nitrate for M1 and mark on

If silver ions or incorrect formula for silver nitrate, penalise M1 but mark M2 and M3

If no reagent or incorrect reagent in M1, then no marks for M2 or M3

For M2

Ignore "nothing"

Ignore "no observation"

Ignore "clear"

Ignore "dissolves"

For M3

Ignore "cloudy solution" OR "suspension"

3

(b) **M1** any soluble sulfate by name or formula e.g. sodium sulfate or sulfuric acid.

M2 white precipitate or white solid/white suspension

M3 remains colourless or no reaction or no (observed) change or no precipitate

OR as an alternative

M1 NaOH/KOH

M2 remains colourless or no reaction or no (observed) change

M3 white precipitate or white solid/white suspension

An insoluble sulfate OR conc H_2SO_4 is CE = 0 for the clip

If no reagent or incorrect reagent in M1, then no marks for M2 or M3

For the M1 soluble sulfate

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If sulfate ions or incorrect formula for the chosen sulfate, penalise M1 but mark M2 and M3

For the M1 NaOH/KOH

If ammonia, then CE = 0

If hydroxide ions or incorrect formula for the chosen hydroxide, penalise M1 but mark M2 and M3

For no (observed) change in both alternatives

Ignore "nothing"

Ignore "no observation"

Ignore "clear"

Ignore "dissolves"

For the white precipitate in both alternatives

Ignore "cloudy solution" OR "suspension"

3

(c) **M1** ammonia (can be dilute or concentrated)

M2 dissolves OR soluble OR (forms a) colourless solution OR goes colourless

M3 does not dissolve OR not soluble OR remains as a solid OR no (observed) change OR no reaction OR yellow solid remains

OR if concentrated ammonia has been used, accept yellow solid turns white.

OR as an alternative using conc sulfuric acid

M1 concentrated sulfuric acid OR c(onc) H_2SO_4

M2 misty/white fumes/gas

OR remains white

OR no change (in colour)

M3 turns black (solid)

OR purple fumes/gas

OR correct reference to H_2S observation (e.g. bad egg smell)

For M1

If incorrect formula or "ammonium", penalise M1 but mark M2 and M3

If no reagent or incorrect reagent in M1, then no marks for M2 or M3

For M3

Ignore "nothing"

Ignore "no observation"

For the alternative using sulfuric acid

If dilute sulfuric acid or "aq" (alone) or the idea of concentrated not included CE = 0

If incorrect formula, penalise M1 but mark M2 and M3

If no reagent or incorrect reagent in M1, then no marks for M2 or M3

3

(d) **M1** acidified potassium dichromate or $K_2Cr_2O_7/H_2SO_4$

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OR $K_2Cr_2O_7/H^+$ OR acidified $K_2Cr_2O_7$

M2 (orange to) green solution OR goes green

M3 (solution) remains orange or no reaction or no (observed) change

Alternative using $KMnO_4/H_2SO_4$

M1 acidified potassium manganate(VII) or $KMnO_4/H_2SO_4$

OR $KMnO_4/H^+$ OR acidified $KMnO_4$

M2 colourless solution OR goes colourless

M3 (solution) remains purple or no reaction or no (observed) change

If no reagent or incorrect reagent in M1, then no marks for M2 or M3

For M1

If "dichromate" or "dichromate(IV)" or incorrect formula or no acid, penalise M1 but mark M2 and M3

For M2 ignore dichromate described as "yellow" or "red"

For M3

Ignore "nothing"

Ignore "no observation"

For M1

If "manganate" or "manganate(IV)" or incorrect formula or no acid, penalise M1 but mark M2 and M3

Credit alkaline $KMnO_4$ for possible full marks but M2 gives brown precipitate or solution goes green

3

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Q2.

(a) (i) Green

Ignore shades of green.

1

(ii) Excess acidified potassium dichromate(VI)

1

Reflux (for some time)

1

In the diagram credit should be given for

- a vertical condenser

Lose M3 and M4 for a distillation apparatus.

1

- an apparatus which would clearly work

Do not allow this mark for a flask drawn on its own.

Penalise diagrams where the apparatus is sealed.

1

(iii) Distillation

1

Immediately (the reagents are mixed)

1

(b) Keep away from naked flames

Allow heat with water-bath or heating mantle.

If a list is given ignore eye protection, otherwise lose this mark.

1

(c) (i) Tollens' or Fehling's reagents

*Incorrect reagent(s) loses **both** marks.*

Accept mis-spellings if meaning is clear.

1

Silver mirror / red ppt. formed

Accept 'blue to red' but not 'red' alone.

1

(ii) Sodium carbonate (solution) / Group II metal

Allow indicator solutions with appropriate colours.

Accept any named carbonate or hydrogen carbonate.

1

Effervescence / evolves a gas

Accept 'fizzes'.

1

(d) Propanoic acid

If this mark is lost allow one mark if there is reference to stronger intermolecular forces in the named compound.

Lose M1 and M3.

1

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Contains hydrogen bonding

1

Some comparison with other compounds explaining that the intermolecular forces are stronger in propanoic acid

1

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