

**MARK SCHEME for the October/November 2010 question paper  
for the guidance of teachers**

**0620 CHEMISTRY**

**0620/61**

Paper 6 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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- 1 (a) ethanol and aluminium oxide boxes correctly labelled [1]
- (b) arrow towards wool (1) arrow towards solid (1) [2]
- (c) to prevent suck back or description of suck back owtte (1)  
effect of suck back e.g. crack tube (1) [2]
- [Total: 5]**
- 2 (a) to speed up the reaction [1]
- (b) solid visible owtte e.g. no more solid will dissolve [1]
- (c) filtration / centrifuge **not** decant [1]
- (d) to make sure water (of crystallisation) is not lost / stop dehydration /  
so crystals do not turn into powder / does not decompose **not** crystals break [1]
- (e) no heat needed / not necessary to warm acid (1)  
carbonates react with acid at room temperature (1)  
no bubbles would indicate that carbonate is in excess (1) [max 2]
- [Total: 6]**
- 3 (a) idea of fair test / only one variable [1]
- (b) nitric acid [1]
- (c) (i) points plotted (3), –1 for each incorrect  
smooth curve (1) [4]
- (ii) value from graph 18 s (1) indication on graph (1) [2]
- (d) times would be less / reaction quicker (1)  
particles have more energy / increased collisions (1) [2]
- [Total: 10]**

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- 4 total volume of water boxes correctly completed (1)  
10, 11, 12, 13, 14  
temperature boxes completed (4) –1 each incorrect  
68, 63, 59, 55, 51 [5]
- (a) appropriate scale for y-axis (1)  
points plotted correctly (4), –1 for each incorrect  
best fit straight line graph (1) [6]
- (b) clear liquid formed / no solid visible owtte [1]
- (c) value from graph for 9 cm<sup>3</sup> of water, around 72 °C (1)  
extrapolation of straight line shown (1) [2]
- (d) temperatures at which crystals appear lower (1)  
solution more dilute in same volume of water / less saturated owtte (1) [2]
- (e) sketch graph below line (1) label (1) [2]
- (f) one improvement from e.g.  
don't use a beaker of cold water to cool solution /  
do not remove thermometer from the solution /  
use second person or IT method to note formation of crystals /  
repeat  
  
linked explanation  
different rate of heat losses /  
loss of solid on thermometer /  
observing formation of first crystals may vary /  
average  
mean more accurate / increases reliability [2]  
**not** just accurate
- [Total: 20]**
- 5 (a) (i) blue (1) [1]
- (ii) blue (1) precipitate (1) [2]
- (iii) blue precipitate (1)  
deep / royal blue (1) solution (1) **or** precipitate dissolves [3]
- (c) sulfuric acid (2) acid or sulfate only (1) [2]
- [Total: 8]**

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- 6 (a) bubbles / fizzing / effervescence [1]
- (b) alkali formed [1]
- (c) (i) chlorine [1]
- (ii) indicator bleached / decolourised **allow** yellow [1]
- [Total: 4]**
- 7 (a) universal indicator / pH paper (1) **not** litmus  
pH of 4–6 / yellow / orange (1) **not** red [2]
- (b) sodium hydroxide / carbonate / oxide [1]
- (c) marks can be obtained from diagram  
chromatography (1) description of applying E110 to paper (1)  
use of solvent (1) results / number of spots (1) [4]
- [Total: 7]**