# Identification of Ions and Gases

## Mark Scheme 3

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**Time Allowed:** 57 minutes

**Score:** /47

**Percentage:** /100
tests on solid E

(c)  (i) white (1) precipitate (1) with excess dissolves/clears/colourless (1) [3]

(ii) white precipitate (1) insoluble/no change (in excess) (1) [2]

(d) contains water/hydrated (1) [1]

(e) ammonia (1) not ammonium [1]

(f) nitrate (1) hydrated salt (1) not a sulfate (1) max [2] [2]
2  (a)  (i) blue (1)  
   (ii) blue (1) precipitate (1)  
   (iii) blue precipitate (1)  
       deep / royal blue (1) solution (1) or precipitate dissolves  

   (c) sulfuric acid (2) acid or sulfate only (1)  

[Total: 8]

3  (a) add dilute acid (1) fizz, no fizz (1) or correct chloride test  

   (b) litmus paper/named indicator (1) turns blue (1) bleached (1)  

   (c) sodium hydroxide/ammonia (solution) (1) green (precipitate) (1)  
       brown (precipitate) (1)  

4  tests on solid S  

   (c) blue precipitate (1)  
   (ii) blue (1) precipitate (1)  
       dissolves/clears (1) deep/royal blue (1)  
   (iii) white (1) precipitate (1)  

   (f) V is more reactive or converse (1)  
   (ii) oxygen (1)  

   (g) catalyst/transition metal/manganese oxide any two points (2)  
       V is a better catalyst = 2
5  (a) (conical) flask (1) (gas) syringe (1)  

(b) to stop loss of gas owtte/stop mixing/so that they don't react  

(c) glowing splint (1) relights (1)  
lighted splint = 0 ignore 'pops'

6  (a) add aluminium/Devarda's alloy and sodium hydroxide (warm) (1)  
    ammonia/alkaline gas formed/turns red litmus blue (1)  
    for a 'near miss' in reagents allow a mark for ammonia

(b) boiling point (1) 100°C (1)

(c) bromine (water) (1)  
goes colourless (1)  
not clear