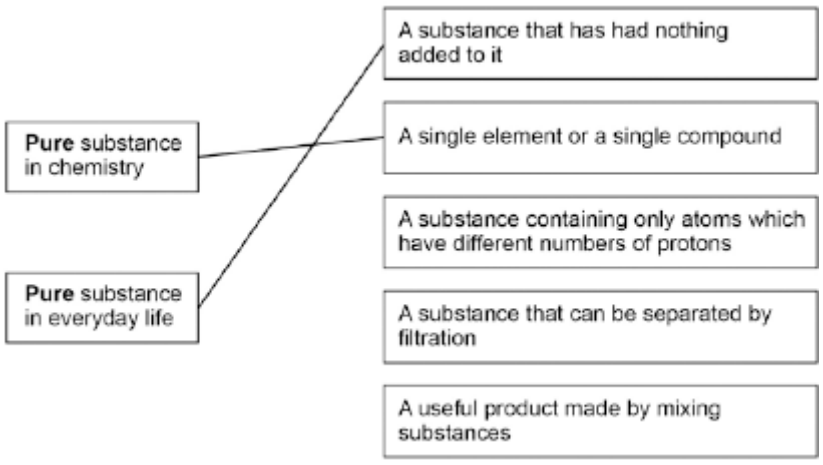
**M1.**(a) Air

**2**

Steel

**1**

(b)




Allow **1** mark for the correct meanings linked to context but incorrect way around

**1**

**1**

(c) Damp litmus paper turns white

**1**

(d) Iron(III)

**1**

**[6]**

**M2.**(a) (i) Filtration

**1**

(ii) Chlorine

**1**

(b) (i) nanoparticles are small / smaller / much smaller / tiny

*allow any in range 1–100 nm or $1 \times 10^{-9}$ m – $1 \times 10^{-7}$ m **or** a few hundred atoms in size*

*ignore numbers if stated smaller*

**1**

(ii) they have a high surface area to volume ratio

*reference to surface area without volume ratio is insufficient*

*allow nanoparticles are very reactive **or** nanoparticles are more reactive than normal particles.*

**1**

(c) (sodium hydroxide) produces a white precipitate

*accept solid / suspension or ppt or ppte for precipitate.*

*ignore cloudy / milky*

**1**

which (then) dissolves / disappears (in excess sodium hydroxide)

*M2 cannot be awarded unless a solid of some sort has been made*

*ignore names or formulae of compounds*

**1**

**[6]**

**M3.**(a) copper (II) → blue

iron (III) → brown

*more than one line from any box negates the mark*

**1**
**1**

(b) aluminium

*allow correct answer shown in box if answer line blank*

**1**

(c) (i) yellow

*allow orange*

**1**

(ii) lilac

*allow purple*

**1**

(iii) one colour masks the other

*allow colours mixed*

**1**

**[6]**

**M4.**(a) (i) Solids

**1**

(ii) Chlorine

**1**

(iii) improves dental health **or** reduces tooth decay

**1**

(b) put a sample of the filtered water in an evaporating basin **or** leave to evaporate

*accept any description of evaporation (using a Bunsen or leaving on the windowsill)*

**1**

there will be crystals of salt left

**1**

(c) sodium and / or chloride ions are bigger than water (molecules) **or** ions are charged **or** molecules are not charged

*do **not** accept sodium chloride molecules as ions is given in the question*

**1**

**[6]**

**M5.**(a) (i) *method of introducing sample into flame*

*e.g. wire / splint / spray*

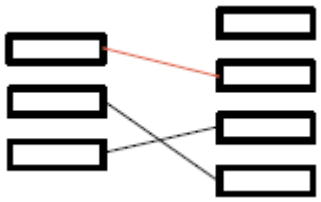
**1**

*clean wire or colourless flame*

*allow blue / roaring flame*

**1**

(ii)



**1**

**1**

(iii) (potassium) chloride

*allow KCl **or** $Cl^-$*

**1**

(b) (i) copper

*allow $Cu^{2+}$*

**1**

(ii) sulfate

**1**

**[7]**

**M6.**(a) (i) so there are no impurities

*accept no other chemicals / not contaminated*

*allow to get the correct result*

**1**

(ii) high melting point

**1**

unreactive

**1**

(iii) yellow-orange

**1**

(b) (i) bubbles / fizz / effervescence

*ignore any named gas*

**1**

(ii) milky

**1**

(c) fast(er)

**1**

small(er) amount

**1**

**[8]**

**M7.**(a) (i) yellow

**1**

(ii) lilac

**1**

(b) (bubble through) limewater

**1**

cloudy

*allow white / milky*

**1**

(c) (i) silver nitrate solution

**1**

(ii) white

**1**

**[6]**

**M8.** (a) (i) milky

**1**

carbonate ions

**1**

(ii) red

**1**

(b) (i) smaller

**1**

(ii) The answer obtained is closer to the true value

**1**

**[5]**

**M9.** (a) stop them reacting

*owtte*

**1**

(b) (i) fizzing / bubbles / effervescence

*owtte*

**1**

(ii) (g)

**1**

(iii) limewater

**1**

(c) yellow

**1**

(d) (i) barium chloride

**1**

(ii) white

**1**

(iii) eg don't see what is being bought

*ignore references to cost*

**or**

a comment about quality / purity
eg may be impure / contaminated

**1**

**[8]**