

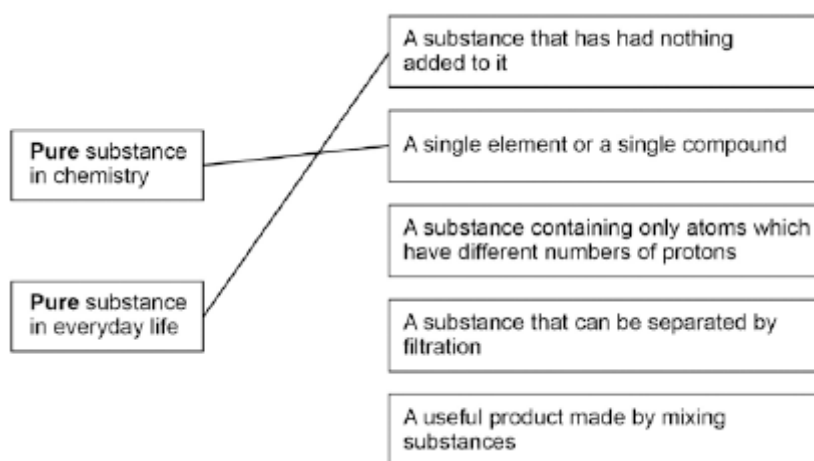
M1.(a) Air

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) 50

1

(b) 5%

1

(c) any **two** from:

- cost (9 carat is cheaper)
- pure gold is soft
- **or**
24 carat gold is soft
- **or**
9 carat gold is harder
allow 9 carat gold is stronger
allow gold is an alloy in 9 carat gold
- can change the colour

2

[4]

M3.(a) sodium loses (electron)

sharing / covalent / metallic = max 2

1

chlorine gains (electron)

1

1 **or** an (electron)

1

(b) (i) Have no overall electric charge

1

(ii) Should iodine be added to salt?

1

reason

any **one** from:

- cannot be done by experiment
accept difficult to get / not enough evidence
- based on opinion / view
allow must be done by survey
- ethical **or** economic issue.

1

(c) (i) nitric (acid)

1

(ii) an alkali

1

(iii) indicator

accept any named acid base indicator

1

(d) (i) Crystallisation

1

(ii) fertiliser

allow to help crops grow

1

- (iii) any **one** from:
- pressure
allow concentration
 - temperature
ignore heat
 - catalyst.

1
[12]

- M4.(a)** alloy 1
- (b) in mixture: 1
- different sized / bigger atoms*
- so there are no layers / rows / lines (to slide)*
- accept converse* 1
- (c) any **two** from: 1
- ignore references to bend and mould*
- cost
 - toxicity
 - strength
 - *appearance of brace*
 - *unreactive **or** resistant to corrosion / saliva*
- allow rusting as alternative to corrosion* 2
- (d) crosslinks 1
- allow lines / bonds between the rows / chains*

[6]

M5.(a) (i) an alloy

1

(ii) harder

1

(b) (i) 162.5

correct answer with or without working gains 2 marks

if no answer or incorrect answer then evidence of correct working

[56 + (3x35.5)] gains 1 mark

2

(ii) 34.46

accept rounding from 34 - 34.5

correct answer with or without working gains 2 marks

accept ecf from (b)(i) correctly calculated for 2 marks

if no answer or incorrect answer then evidence of 56 / 162.5 or 56

/ answer to (b)(i) gains

1 mark

2

[6]

M6. (a) +1/+

do **not** accept 1 without the +

1

electron

allow phonetic spelling

1

(b) (i) elements

1

(ii) non-metal

1

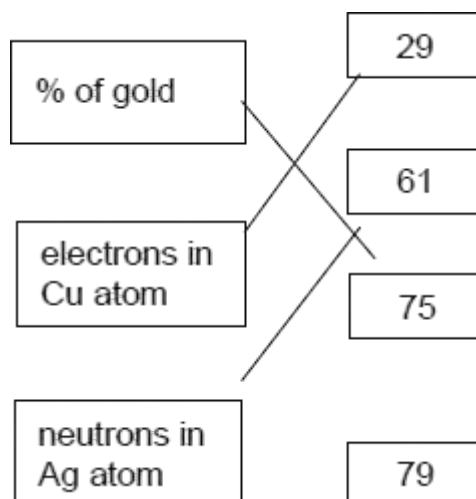
(c) soft

1

an alloy

1

(d)



***one** mark for each correct link
extra lines lose the mark*

3

[9]

- M7.** (a) (i) 2.5(kg)
ignore units 1
- (ii) 40% (cement) **and** Test 3
ignore units 1
- because it is anomalous or because it is much lower than the other two readings
accept value not used to calculate mean
ignore outlier 1
- (iii) as the percentage of cement increases the mass needed to break the sleeper increases
allow 'strength' for 'mass needed'
allow correct relationship using percentage of sand 1
- (iv) volume/percentage / amount of water
accept temperature 1
- (b) any **two** from:
- availability (of the raw materials)
 - cost of the raw materials
 - purity (of the raw materials)
- 2

[7]

- M8. (a) 79 1
- 79 1
- (b) hundred 1
- (c) (i) electron(s) 1
- (ii) three 1
- (d) changes rate of reaction
accept lowers activation energy
- or**
- speeds up / slows down reaction
accept reduces costs 1
- (e) (i) melt 1
- (ii) crosslinking
allow answers on diagram

or

(covalent) bonds between polymers / chains

allow bonds between layers

*do **not** allow intermolecular*

1

[8]