

## 9G Environmental chemistry...mark scheme

### Assessment for learning...year 9 (level 3-6)

#### Question 1:

- (a) sulphur dioxide 1  
nitrogen oxides 1

*answers may be in either order*

- (b) **a reference to sulphur dioxide is required**

- any **one** from 1
- higher concentration of sulphur dioxide by power stations
  - sulphur dioxide kills lichens
  - lichens affected by sulphur dioxide

- (c) water 1  
carbon dioxide 1

*answers may be in either order*

- (d) carbon + oxygen → carbon dioxide 1

*accept 'C + O<sub>2</sub> → CO<sub>2</sub>'*

*do **not** accept 'carbon oxide' or 'carbon monoxide'*

*do **not** accept 'carbon dioxide + water'*

- (e) oxidation 1

*if more than one box is ticked award no mark*

**Question 2:**

- (a) (i) A and D 2  
(ii) C 1

*answers may be in either order*

- (b) any **two** from 2

- paint them *accept 'varnish it'*
- grease them *accept 'WD40'*
- oil them *accept 'plate them' or 'chrome them'*
- galvanise them *or 'coat them with zinc or tin'*
- coat them with plastic *accept 'cover them in plastic'*  
*do not accept 'keep them dry' or 'keep air away'*  
  
*do not accept 'make them from stainless steel'*  
*or any idea of replacement*

**[5]**

**Question 3:**

- (a) **answers must give a definition of biomass and not just provide examples**  
material from living things **or** plant matter 1

- (b) the Sun 1  
*accept 'sunlight' or 'the Big Bang'*  
*do not accept 'light' or 'photosynthesis'*

- (c) coal 1  
oil  
natural gas **or** methane  
*answers may be in any order*  
***all three** fossil fuels are required for the mark*  
*accept 'gas'*  
*for natural gas*  
*accept 'peat' as one of the three fossil fuels*

- (d) they cannot be replaced **or** no more can be produced 1  
*accept 'they get used up'*  
*do not accept 'they cannot be used again'*

- (e) (i) any **one** from 1  
• it is renewable  
• it is widely available

*accept 'you can grow more of it'*  
*accept 'it will conserve fossil fuels'*  
*do not accept 'it is cheaper to produce'*

- (ii) any **one** from 1
- it takes up less space
  - it is more suitable for use in vehicles
  - it contains more energy per unit mass
- accept 'it is more concentrated'*  
*accept 'it can be transported more easily'*

- (iii) any **one** from 1
- pollution
  - they release greenhouse gases
- accept a specific example of a pollutant*  
*eg. 'carbon dioxide is released'*

**[7]**

**Question 4:**

- (a) iron 1  
sulphur

*answers may be in either*  
*order*  
**both** elements are required  
*for the mark*

- (b) (i) copper oxide 1
- accept 'CuO'*

- (ii) any **two** from 2
- it forms acid rain
  - it causes leaf fall
  - it affects breathing
  - it weathers buildings
  - it poisons aquatic organisms
- accept 'it is a pollutant'*
- accept 'it kills plants' or 'it damages trees'*
- accept 'it causes asthma' or 'it is a poison'*
- accept 'it corrodes metals'*
- accept 'it kills fish'*

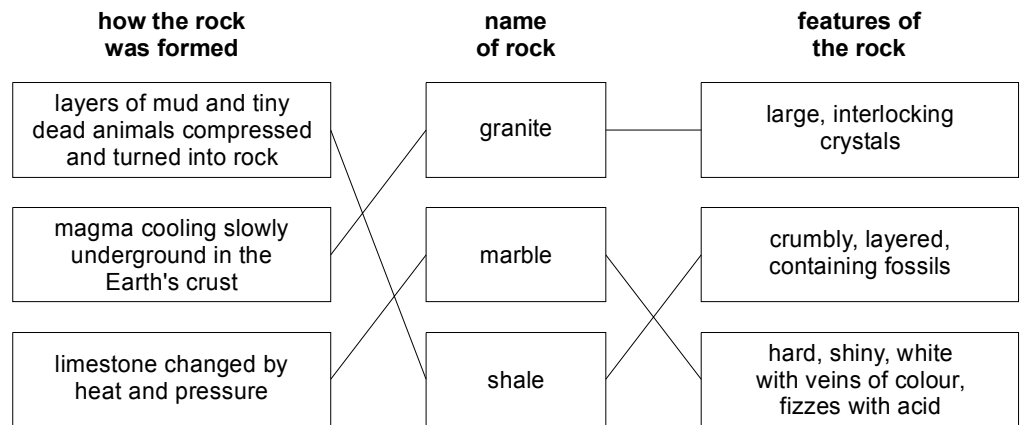
- (iii) alkaline **or** an alkali 1

accept 'basic'

[5]

**Question 5:**

- (a) Both the line from the name of the rock to the method of formation and to the features of the rock must be correct for the mark.



3

- (b) (i) acidic water drains through cracks 1

accept 'rain is acidic'

- water reacts with limestone **or** calcium carbonate 1

accept 'limestone dissolves'

- (ii) any **two** from 2

- low temperatures make water freeze in cracks

accept 'water freezes in cracks'

- water expands as it freezes
- ice expanding breaks up the limestone

accept 'ice forces the rock apart'

[7]