8.3 Acid Deposition

Question Paper

Course	DP IB Chemistry
Section	8. Acids & Bases
Topic	8.3 Acid Deposition
Difficulty	Easy

Time allowed: 30

Score: /22

Percentage: /100

Question 1a

a)
State why chemists use a pH of 5.6 in the classification of acid rain.

[1]

[1 mark]

Question 1b

b)
Carbonic acid, H_2CO_3, is formed when CO_2 dissolves in rainwater.

i)
Formulate an equation to show how carbonic acid is formed in rainwater. [1]

ii)
Formulate an equation to show the dissociation of carbonic acid. [1]

[2 marks]

Question 1c

c)
Two samples of rainwater, A and B, are pH 4.8 and pH 3.8, respectively. What is the relative acidity of sample A compared to sample B, in terms of $[H^+]$ concentration?

[1]

[1 mark]

Question 1d

d)
State two examples of wet acid deposition.

[1]

[1 mark]

Question 2a

a)
State the names of four acids that contribute to the formation of acid deposition.

[1]

[1 mark]

Question 2b

b)
Show, by means of balanced equations, the formation of sulfuric acid starting from sulfur.

[3]

[1 mark]

Question 2c

c)
Identify the changes in oxidation state for sulfur in part b).

[3]

[3 marks]

Question 2d

d)
Write a balanced equation to show the formation of nitric acid, from nitrogen dioxide, oxygen and water.

[1]

[1 mark]

Question 3a

a)
State two man-made sources of the oxides of sulfur and nitrogen.

[2]

[2 marks]

Question 3b

b)
State two natural sources of the oxides of sulfur and nitrogen.

[2]

[2 marks]

Question 3c

c)
State, giving a suitable equation, the effect of acid deposition, from sulfuric or nitric acids, on an iron bridge.

[2]

[2 marks]

Question 4a

a)
State the two ways by which emissions of sulfur oxides are reduced.

[1]

[1 mark]

Question 4b

b)
State a disadvantage of removing **all** the sulfur found in petroleum.

[1]

[1 mark]

Question 4c

c)
Explain the meaning of the term **hydrodesulfurisation**.

[1]

[1 mark]

Question 4d

d)
Compare and contrast two approaches to reducing sulfur oxide emissions.

[2]

[2 marks]