8.3 Acid Deposition

Question Paper

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

Time allowed: 30

Score: /21

Percentage: /100

Question 1a

a)
Determine the hydrogen and hydroxide ion concentration of naturally occurring rainwater, of pH 5.6.

[2]

[2 marks]

Question 1b

b)
Write equations to represent the formation of naturally occurring rain water.

[2]

[2 marks]

Question 1c

c)
The solubility of carbon dioxide in water at 25 °C is 0.1449 g per 100 mL water. Determine the concentration of the dissolved carbon dioxide in mol dm^{-3}.

[1]

[1 mark]

Question 1d

d)
Determine the solubility of CO_2 in ppm.

[1]

[1 mark]

Question 2a

a)
Acid rain can release nitrates in the soil that wash into waterways and cause eutrophication.
Discuss the meaning of the term eutrophication and its impact on plant life.

[4]

[4 marks]

Question 2b

b)
Identify a metal whose toxic ions can be released into waterways from the effects of acid deposition.

[1]

[1 mark]

Question 2c

c)
Aluminium hydroxide can be dissolved out of rocks under acidic conditions and release aluminium ions into the environment.
Formulate an ionic equation for the reaction.

[1]

[1 mark]

Question 2d

d)
Aluminium hydroxide is amphoteric and can react with alkalis to form aluminate salts. Formulate an equation for the reaction between aluminium hydroxide and sodium hydroxide.

[1]

[1 mark]

Question 3a

a)
Two of the four oxoacids found in acid deposition are sulfurous acid, H_2SO_3 and nitrous acid, HNO_2.
Write equations to show the formation of these oxoacids from sulfur and nitrogen.

[4]

[4 marks]

Question 3b

b)
State the name and formula of the conjugate base of sulfurous acid, H_2SO_3.

[2]

[2 marks]

Question 3c

c)
Suggest ways of decreasing the impact of sulfurous acid on the environment.

[2]

[2 marks]