

**CHEMISTRY 12
ACID RAIN WORKSHEET**

READ pgs 186 - 188 in Hebden to answer the following questions:

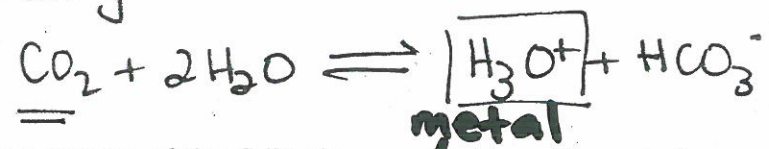
1. What pH must rain have in order for it to be considered "acid rain"? What are the possible causes of this pH? (2 marks)

In order to be considered "acid rain", rain must have a pH < 5.6. The possible causes of acid rain include "SO_x: SO₂ and SO₃" and "NO_x: NO and NO₂" which are produced by the burning of fuels + combustion reactions.

2. What is the normal pH for rain water? What is responsible for this pH? (2 marks)

The normal pH for rain water is pH = 5.6. Rain water is slightly acidic because of atmospheric

CO₂ (acid anhydride)

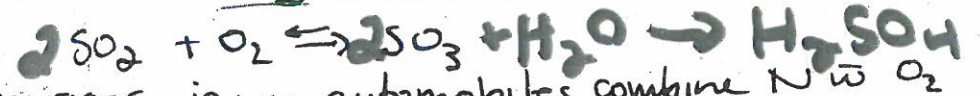


3. Describe the sources of the following non-oxides: (4 marks)

SO_x { SO₂: is formed when fuels containing sulphur are burned



SO₃: is formed when SO₂ combines with atmospheric O₂



NO: combustion rxns ie: in automobiles combine N w O₂



NO₂: is formed when NO reacts with O₂



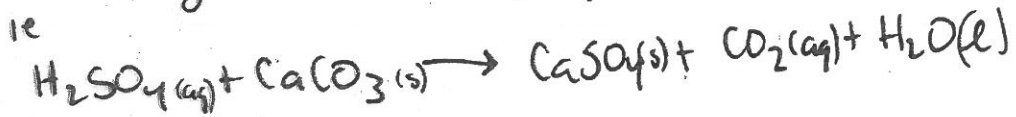
The combined soup of H₂SO₃, H₂SO₄, HNO₂ + HNO₃ constitutes "acid rain"

4. Describe the TWO natural ways that lakes are protected against acid rain.
(2 marks)

1) most lakes have a moderate $\text{CO}_2/\text{HCO}_3^-$ buffering system



2) some lakes are ~~also~~ limestone-rich areas & limestone can neutralize the acidity of acid rain



5. Explain TWO environmental problems associated with acid rain.
(2 marks)

Two of:

1. Fish

2. rocks/minerals

3. metal/stone structures