ACIDS AND THEIR PROPERTIES

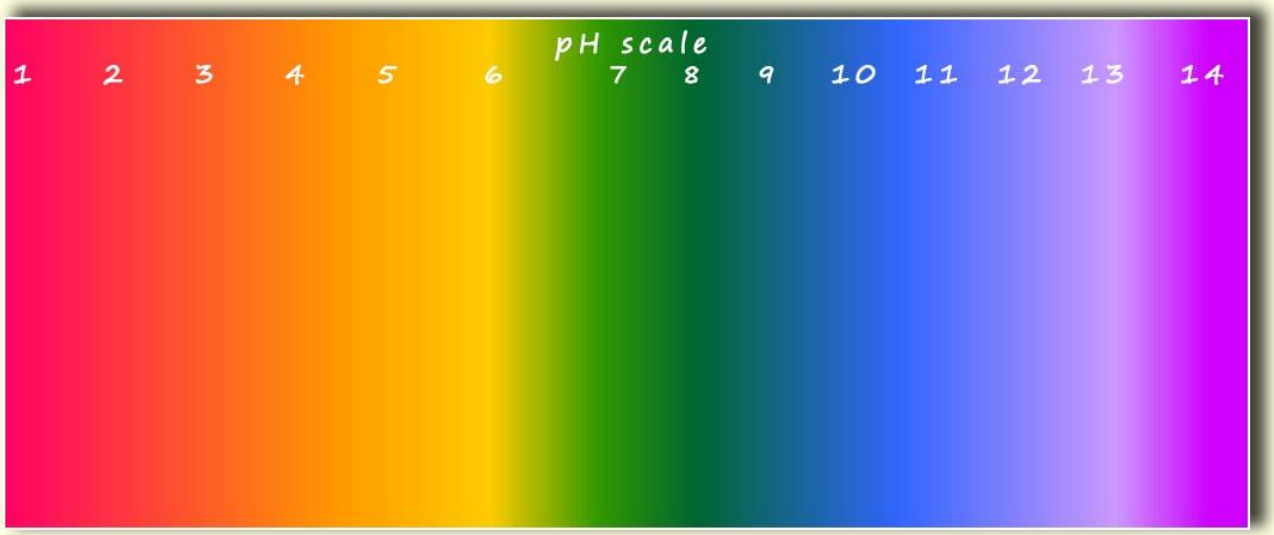
Answer all the questions below and then check your answers.

1. Name three strong acids commonly used in the laboratory.

2. What is the pH of an acid?

3. What is an indicator?

4. The colour chart for universal is shown below.



a. Name 2 weak acids, 2 neutral substances, 2 weak alkalis and 2 strong alkalis.
b. What colour will a strong acid turn universal indicator?
c. What colour will water turn universal indicator?
d. Potassium hydroxide is a strong alkali. What colour will it turn universal indicator?

5. The symbol opposite is likely to be found on bottles of acids and alkalis. What does it mean?

6. Some acids are dangerous and care must be taken when using them. However other acids are found in many foods.

a. Why are acids added to foodstuffs?

b. What acid is found in fizzy drinks?

7. Complete the table below:

Acid	Molecular formula
hydrochloric	
sulfuric	
nitric	

a. What ion is found in all acids?
b. What is the difference between a dilute and a concentrated acid?
c. What is the difference between a strong acid and a weak acid?

8. How does the concentration of hydrogen ions change when the following pH changes occur:

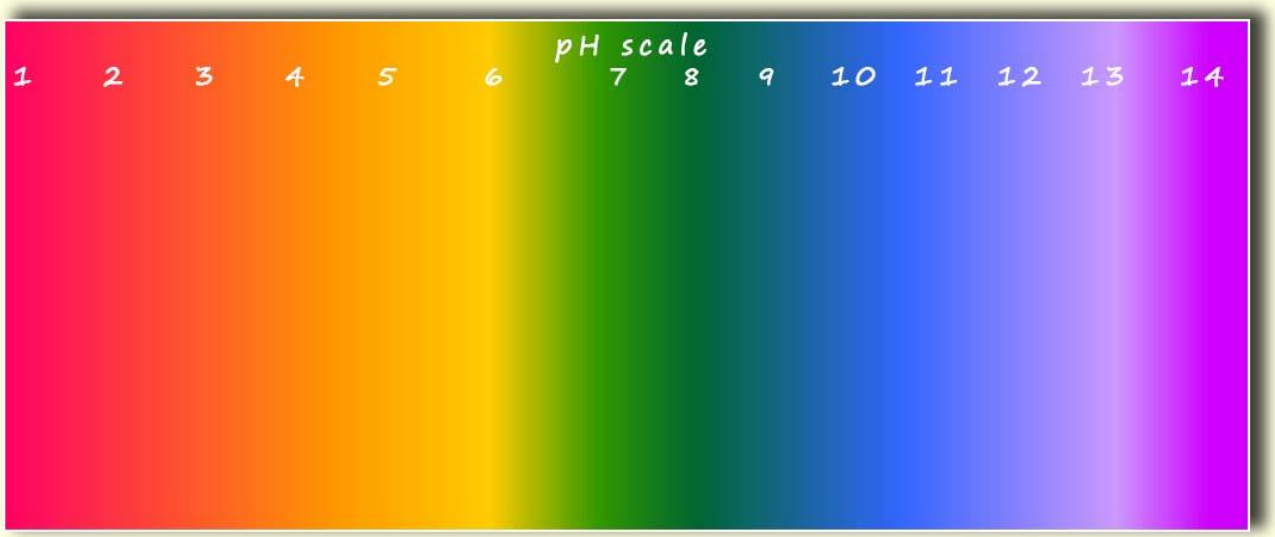
a. pH3 to pH5?
b. pH4 to pH7?
c. pH4 to pH2?

Answers

1. Name three strong acids commonly used in the laboratory.
   Hydrochloric, nitric, sulfuric
2. What is the pH of an acid? Less than 7.

3. What is an indicator? Dye which changes colour due to pH of a solution.

4. The colour chart for universal is shown below.



a. Name 2 weak acids, 2 neutral substances, 2 weak alkalis and 2 strong alkalis.
Weak acids: ethanoic acid, citric acid, ascorbic acid (vitamin C), tannic acid
Neutral : water, sodium chloride solution
Strong acids: hydrochloric, sulfuric and nitric acids.

b. What colour will a strong acid turn universal indicator? red
c. What colour will water turn universal indicator? green
d. Potassium hydroxide is a strong alkali. What colour will it turn universal indicator? purple

5. The symbol opposite is likely to be found on bottles of acids and alkalis. What does it mean?
   Corrosive solution. Corrosive means it kills living cells. It does NOT mean it burns you!!!!

6. Some acids are dangerous and care must be taken when using them. However other acids are found in many foods.

   a. Why are acids added to foodstuffs?
      Preservative e.g. vinegar is used to pickle many foods, citric acid added to give sour taste to many sweets and foods.
   b. What acid is found in fizzy drinks? Carbonic acid

7. Complete the table below:

Acid	Molecular formula
hydrochloric	HCl
sulfuric	H_2SO_4
nitric	HNO_3

   a. What ion is found in all acids? H^+

b. What is the difference between a dilute and a concentrated acid? Dilute acids have lots of water added to them. Concentrated acids have less water.

c. What is the difference between a strong acid and a weak acid? Strong acids fully dissociate (break up) when added to water, weak acids only partly dissociate or break up in water.

8. How does the concentration of hydrogen ions change when the following pH changes occur:

a. pH3 to pH5? decreases by x100

b. pH4 to pH7? decreases by x1000

c. pH4 to pH2? Increases by x 1000

note, low pH means very acidic, lots of hydrogen ions, high pH means alkaline, so less hydrogen ions. As pH changes up 1 unit the concentration of hydrogen ions decreases x10, when pH goes down the hydrogen ion concentration increases x10