Determine the pH values of hydrochloric acid at different strengths using; (i) pH papers and (ii) universal indicator solution

Requirements

Test tubes, measuring cylinder, glass rod, universal indicator solution, pH paper, 0.1 M HCl, 0.01 M HCl, 0.001 M HCl, 0.0001 M HCl and 0.00001 M HCl.

Procedure

1. **Using pH Paper.** Put 2-3 drops of the sample solution on pH paper by means of a glass rod and observe the colour on the pH paper. Now compare the shade of colour formed with various colours given on the 'pH indicator chart'. From this, note the approximate pH of the sample solution and record in the table.

2. **Using Universal Indicator Solution.** Take five test tubes, clean and dry them. Take 5 ml of each given solution in different test tubes with the help of measuring cylinder. Now put 2-3 drops of universal indicator in each test tube by means of a dropper. Note the colour of solution in each test tube and compare its colour with different colour shades as given in the 'pH indicator chart'. After comparing the colour in each tube, note the pH of solution and record in the table.

Observations And Result

Approximate pH of Sample Solutions of hydrochloric acid

Sample No.	Molarity of acid	For pH paper		For universal indicator		Calculated pH = – log $[H_3O^+]$
		Colour produced an pH paper	Approximate pH value	Colour produced in solution	Approximate pH value	
1.	10^{-1} M					
2.	10^{-2} M					
3.	10^{-3} M					
4.	10^{-4} M					
5.	10^{-5}M					

Conclusion

(i) The pH of acid solutions is less than 7.

(ii) The pH of an acid solution …… with decrease in concentration.