ACID-BASE INDICATORS are substances that change colour when reacted with an acid or a base.
Exists as 2 conjugate forms of different colours.

Based on Bronsted-Lowry and equilibria...

$HIn_{(aq)} + H_2O_{(aq)} \leftrightarrow In^-_{(aq)} + H_3O^+_{(aq)}$

acid — base

red — blue

Use the acid/base indicator table on your periodic table to predict the colour of the indicator at a certain pH level.

If the pH falls within the pH range for a colour change, the result will be a mixture of the two colours.

Example:

methyl violet yellow green blue

0 - 1.6

Make a line from 0-14 and label the colours for bromothymol blue over the 0-14 range.

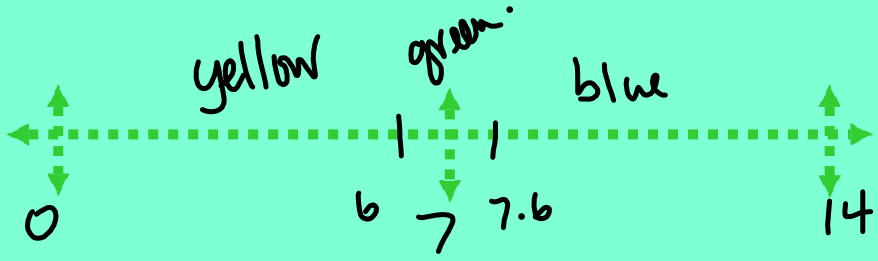
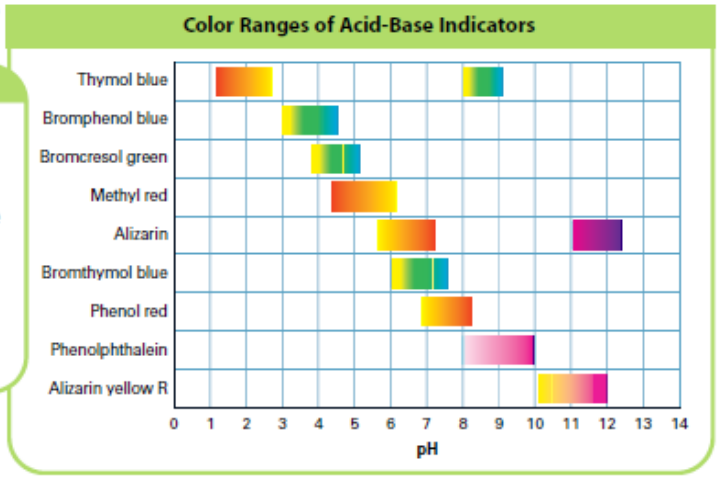


Figure 19.12 Indicators change color at a different pH.

INTERPRETING GRAPHS

a. Identify Which indicator changes color in a solution with a pH of 2?
b. Compare and Contrast What do you notice about the range over which each indicator changes color?
c. Apply Concepts Which indicator would you choose to show that a solution has changed from pH 3 to pH 5?



Problem: What is the pH of an unknown solution?

Evidence: Separate samples of the solution turned blue litmus red, congo red to blue, and orange IV to yellow.

2.8 - 3.0 pH range!

- litmus: acid
- congo red: <3.0 less than 3.0
- orange IV: >2.8

EX: A solution of unknown pH has the following effect on indicators. Find the pH range.

4.4 – 5.2

methyl orange (yellow) >4.4
chlorophenol red (yellow) <5.2
bromocresol green (green) ~~3.8 - 5.4~~

4.4 - 5.2