

Acid Base Indicator Lab

Homeostasis is the state of steady internal, physical and chemical conditions maintained by living systems. Maintaining this stable **equilibrium** is necessary for life due to proteins. Living things rely on proteins to regulate processes (enzymes), build internal structures (muscles, skin, etc.), transport material (cell membrane transport proteins), signal metabolic (bodily) activities (hormones), defend against antigens (antibodies), and much more. Proteins require a small window range where they work optimally. Increasing temperature above **optimal** or decreasing pH below optimal will result in the protein losing its function due to a change in its structure. This is called denaturation (the protein becomes **denatured**).

In today's lab we are going to test a strong base and a strong acid to see how two different indicators behave in these types of solutions. Chemical **indicators** are substances that give a visible sign, usually by a color change, of the presence or absence of a threshold concentration of a chemical. In today's short lab we will be testing phenolphthalein and universal indicator .

The diagram to the right models the organization of your test tubes

- Hydrochloric acid is a strong acid. Sodium Hydroxide is a strong base.
- Write down the colors before and after adding the indicators to the solutions in the chart below.

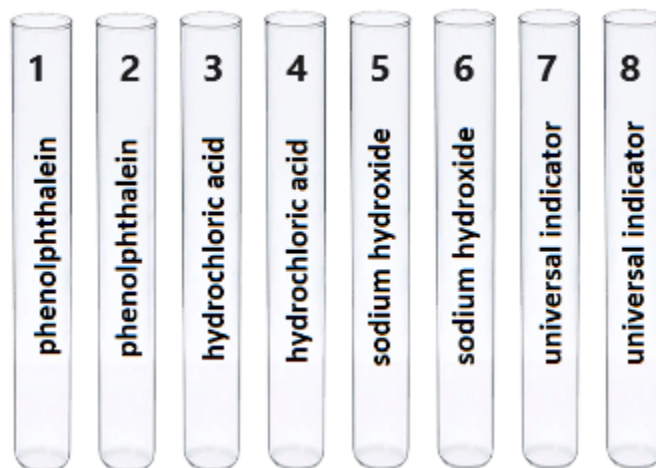
Instructions:

Pour test tube number 1 into test tube 3, record results.

Pour test tube number 7 into test tube 4, record results

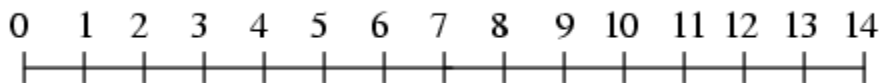
Pour test tube number 2 into test tube 5, record results.

Pour test tube number 8 into test tube 6, record results



Solution	Color before adding either indicator	Color after phenolphthalein	Color after universal indicator
Hydrochloric acid (Acid)			
Sodium Hydroxide (Base)			

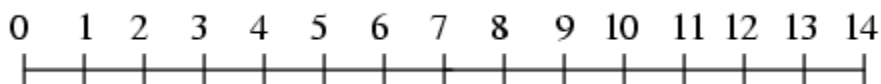
NEUTRAL



Draw the correct number line for neutral substances above and write the inequality here: _____

~~~~~

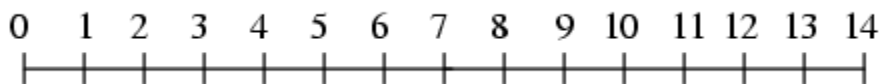
## ACIDIC



Draw the correct number line for acidic substances above and write the inequality here: \_\_\_\_\_

~~~~~

BASIC

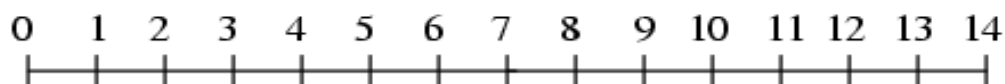


Draw the correct number line for basic/alkaline substances above and write the inequality here: _____

~~~~~

On the number line below, label acidic, basic, an neutral and then under it write what colors phenolphthalein and universal indicator will be in those substances

### The pH scale



|                     |  |  |  |
|---------------------|--|--|--|
| phenolphthalein     |  |  |  |
| Universal indicator |  |  |  |

| Analysis Questions (check the box to the right to answer)                 | Denature | Work better | Change function | nothing | Not enough information |
|---------------------------------------------------------------------------|----------|-------------|-----------------|---------|------------------------|
| What will happen to a protein if you place it in a pH of 2?               |          |             |                 |         |                        |
| What will happen to a stomach enzyme if you place it in a pH of 2?        |          |             |                 |         |                        |
| What will happen to a protein in your blood if you place it in a pH of 2? |          |             |                 |         |                        |