

Using Hibiscus petals as an acids and bases indicator

GARFIELD PARK
CONSERVATORY
ALLIANCE



Grade: 6-12th

MS-PS1-2, PS1A, PS1B, MS-PS1
HS-PS1-7

Introduction:

Hibiscus flowers contain the colour pigment anthocyanin, which is a natural chemical indicator.

As we celebrate Black history month we pay homage to the ancestors whose many uses for this plant, from medicinal and holistic remedies to a delicious drink used in celebratory moments are remembered now and beyond.

For this activity we will use the hibiscus petals (*Hibiscus rosa-sinensis*) to create a fun ph indicator

Materials

Hibiscus petals
Water
Gloves
Old shirts or aprons (hibiscus stains so be sure to protect your hands and clothing)
Stove & pot for boiling OR electric kettle if available, otherwise you can also steep overnight without heat.
1 cup of orange juice and apple juice
Salt
Window cleaner
Mesh sieve and/or cheese cloth
Test tubes or small container for mixing liquids
Droppers



Making the indicator:

- Place a small amount of the hibiscus petals in a pot with water
- Boil the mixture for 3-5 minutes, no need to stir
- If you don't have access to a hot plate or stove you can steep the petals in water for 24 hours or until the color is a deep red.
- Allow your mixture to sit as this will allow all the sediment to settle at the bottom. You can use this timeset up your containers with the other liquids.
- Gently strain the liquid into a separate container. You can save the petals for a second round or to make some hibiscus water later.
- Using a 1:1 ration pour each of the liquids into their own container and add the same amount of water. Gently stir or shake to dissolve each substance in water.
- Put your indicator to the test! Use a dropper to add 4 or 5 drops of hibiscus water to each test tube. You'll notice a color change right away as the hibiscus petals interact with the chemical.
- Hibiscus flowers contain the colour pigment anthocyanin, which is a natural chemical indicator.

The color change will tell you if it's acidic or basic. The pH scale ranges from 0 to 14. A pH of less than 7 indicates acidity, while a pH of more than 7 indicates a base. Anywhere from dark pink to pale pink usually indicates an acid, while dark gray to green colors usually indicate a base. The rest of the colors indicate:

- Dark pink: pH 2
- Pink: pH 3 to pH 4
- Pale pink: pH 5
- Lavender: pH 6
- Gray: pH 7 or pH 8
- Dark gray: pH 9
- Brown: pH 10 or pH 11
- Green: pH 12

Post discussion questions:

- Discuss how acids in your body help with health and fighting/ breaking down certain compounds and foods.
- What are the benefits and risk of certain acids?
- How do certain foods help with gut health?



Notable person of science highlight:

Marie M. Daly

- Best known for being the first African American woman to receive a Ph.D. in chemistry in the United States.
- Marie Daly was a chemist who studied the relationship between cholesterol and heart health.
- Daly researched how compounds produced in the body participate in digestion.