

Chemical properties of soil – Exercise C01d

Soil pH: Red cabbage¹

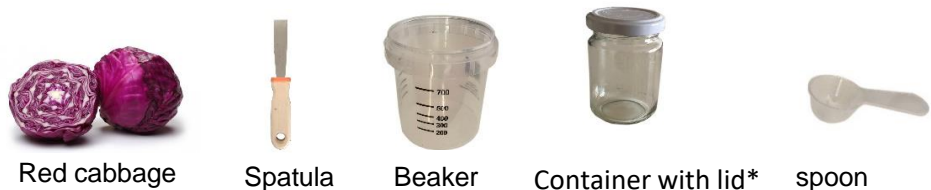
Exercise suggested by PUEIS (Promotor in México)²

Reference posters 12a -12b-12c

RELEVANCE

Soil pH is a soil chemical property playing a key role in regulating nutrient availability and other soil processes. Single nutrients are available for plant uptake at different soil pH, therefore different crops thrive at different pH values. Ranges of pH values between 5.5 and 7.5 are suitable for most of the crops because they can support a larger variety of nutrients. At pH values less than 7, the soil is acidic, whereas at pH values greater than 7, the soil is alkaline. We here describe the evaluation method based on red cabbage water. Red cabbage contains anthocyanins, a natural colorant that reacts with acidic and alkaline substances giving red/pinkish or blue/green coloration respectively.

MATERIALS



**Not present in the kit*




PROCEDURE

1) Prepare the red cabbage water: finely chop 1 cup of the red cabbage and boil it in 1 cup of water for half an hour until water turns purple. Let the cabbage water to cool and pour it into a container with lid.



2) Collect a sample of soil with the spatula and put it in the beaker. Using the spoon, add 20ml of cabbage water and observe the change of color.



PROCEDURE	3a) If the solution turns pinky-red, the soil is acidic	 © S. Pioli
	3b) If the solution turns blue or green, the soil is alkaline	 © S. Pioli
	3c) If the solution does not change color, try to add more water or more soil. If you still do not observe any color change, the soil is neutral .	 © S. Pioli
ADVANTAGES OF THE METHOD	Quick and easy to estimate. Does not require specific knowledge or expensive tools. If alcohol is added to the red cabbage water, it can be stored for several weeks and used for multiple testing.	
DISADVANTAGE OF THE METHOD	It gives a qualitative assessment of the pH. The red cabbage may be not always available in all countries.	
QUESTIONS TO BE ADDRESSED	Did the soil react with the red cabbage water? Is soil acidic, alkaline or neutral? Is my crop suitable for this type of soil, according to its pH? What are the practices to improve soil pH?	

EVALUATION EXAMPLES		
POOR	MODERATE	GOOD
Too acidic or too alkaline soil. The color of the solution is red or yellow	Slightly acidic or alkaline soil. The color of the solution is pink or green	Neutral soil. No changes in the solution color

¹ museodeciencias.unav.edu and redalyc.org/pdf/920/92030108.pdf

² https://pueis.unam.mx/