

Are All Sugars Sweet?

In this experiment, you will compare the sweetness of several different sugars by tasting them. You will also compare the sweetness of these sugars with a sugar substitute. Since tasting chemicals can be dangerous, you should never do so unless instructed by your teacher.

Sugars belong to the organic molecule group called carbohydrates. Carbo- "carbon" and hydrate "water", hence they have the general formula ratio of CH_2O . Each different sugar has its own specific shape and will initiate different reactions with the taste receptors on the tongue.

Procedure:

Place a small amount of one of the sugars in your mouth. In the table, record the relative sweetness (i.e. very sweet, sweet, slightly sweet, not sweet at all). Rinse your mouth with water before tasting the next sugar.

<i>Sugar</i>	<i>Formula</i>	<i>Relative Sweetness</i>
sucrose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	
maltose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	
lactose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	
glucose	$\text{C}_6\text{H}_{12}\text{O}_6$	
galactose	$\text{C}_6\text{H}_{12}\text{O}_6$	
fructose	$\text{C}_6\text{H}_{12}\text{O}_6$	
substitute	—	

Questions:

1. Rank the compounds in order of sweetness.
2. Research the shape of the sugars in a biology or chemistry textbook. Draw and label two of them.

3. Define "isomer"

4. Which of the "Sugars" are isomers of each other? (2 sets)