

LESSON  
35

FOLLOW-UP

# Making Scents

## Analyzing Ester Synthesis

Name \_\_\_\_\_

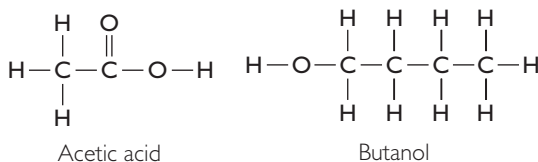
Date \_\_\_\_\_ Period \_\_\_\_\_

### Purpose

To analyze the results of the ester synthesis lab.

### Analysis

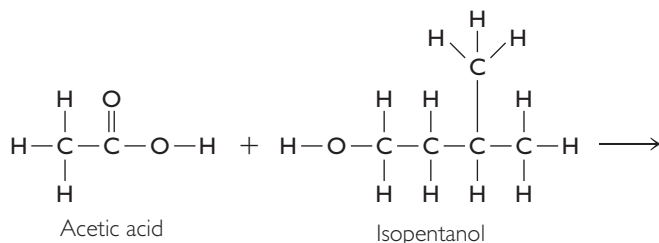
- In the ester synthesis lab, how did the smell of the mixtures before heating compare to the smell of the mixtures after heating?
- Based on the smell of the mixtures after heating, what functional group must be present in the final molecules that were produced? Draw it.
- Using these two structural formulas, build a new molecule that contains the functional group you identified in Question 2. This is a chemical reaction, so you are allowed to break bonds and make new ones.



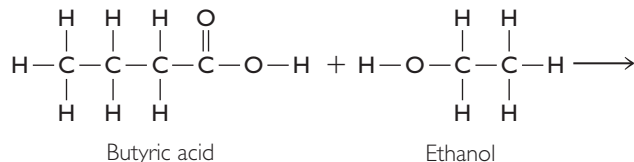
- Are there any atoms that were not used to make the sweet-smelling molecule in Question 3? If so, what molecule do these pieces make?
- Complete this chemical equation. Make sure that the equation is balanced (the same number of carbon, hydrogen, and oxygen atoms on both sides of the arrow).  

$$\text{C}_2\text{H}_4\text{O}_2 + \text{C}_4\text{H}_{10}\text{O}$$
- What evidence do you have that this reaction took place in your test tube?

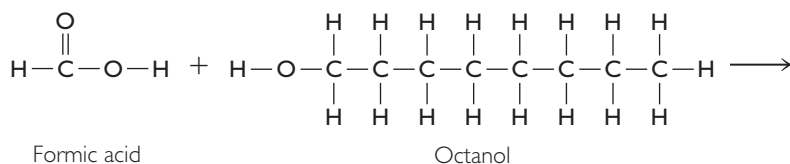
7. The reaction between acetic acid and isopentanol produces a sweet smell. Draw the structural formulas of the products, water and isopentyl acetate.



8. The reaction between butyric acid ( $\text{C}_4\text{H}_8\text{O}_2$ ) and ethanol ( $\text{C}_2\text{H}_6\text{O}$ ) produces a sweet smell. Draw the structural formulas of the products, water and ethyl butyrate.



9. Imagine that you used the following acid and alcohol in the lab to create a sweet-smelling molecule. Draw the structural formulas of the products, water and octyl formate.



10. What are the molecular formulas of the sweet-smelling products in Questions 5 and 8? Draw the structural formulas of these two molecules next to each other. Why do you think the molecules in Questions 5 and 8 smell different?

11. **Making Sense** Use your own words to describe what happens on a *molecular* level when an acid and an alcohol react.

12. **If You Finish Early** See if you can figure out how the products of these reactions are named. What would be the name of the product in Question 3?