POST LAB ACTIVITY - ESTERIFICATION LAB

In this experiment you synthesized isopentyl acetate (banana oil) by reacting isopentyl alcohol with acetic acid:

\[
\begin{align*}
\text{CH}_3\text{C-CH}_2\text{-CH}_2\text{-OH} & \quad + \quad \text{HO-C-CH}_3 & \quad \rightarrow \quad \text{CH}_3\text{C-CH}_2\text{-CH}_2\text{-O-C-CH}_3 & \quad + \quad \text{H}_2\text{O} \\
\text{CH}_3 & & \text{CH}_3
\end{align*}
\]

*isopentyl alcohol  acetic acid  isopentyl acetate  water*

PROCEDURE

PART A:

1. Cut out the individual alcohol and acid rectangles on page 4.
2. Match the appropriate alcohol rectangle with an acid rectangle to obtain the 5 ester combinations listed below.
3. Cut off the OH⁻ and H⁺ portions of the rectangles (this corresponds to the loss of water when the ester is formed.
4. Paste the portions of the rectangles in the numbered spaces provided below indicating the proper products formed when synthesizing each of the 5 esters named below.

\[
\begin{align*}
1. \text{ isopentyl acetate (banana oil)} \\
2. \text{ n-propyl 2-methylpropanoate (rum)} \\
3. \text{ isobutyl methanoate (raspberries)} \\
4. \text{ octyl acetate (oranges)} \\
5. \text{ n-butyl butanoate (pineapple)}
\end{align*}
\]

1.

2.
PART B:

Write structures for 5 more esters formed from the same 5 alcohols and acids. Write their names on the lines provided. (hint: look for new combinations with the paper models)

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________

PART C:

In this experiment you synthesized isopentyl acetate (banana oil) by reacting isopentyl alcohol with acetic acid (See page 1).
1. Use the individual alcohol and acid rectangles from page 4.

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2. Match any alcohol rectangle with any acid rectangle to obtain 5 ester combinations.
3. Cut off the OH and H portions of the rectangles (this corresponds to the loss of water when the ester is formed).
4. Paste the portions of the rectangles on page 3 indicating the resulting products.
5. Name them.
6. When finished compare your esters with the 3 other students in your group.

Ester #1: Name ____________________________

Ester #2: Name ____________________________

Ester #3 Name ____________________________

Ester #4 Name ____________________________

Ester #5 Name ____________________________

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Chemistry Ester Pre/Post Lab, Page 5 6/21/95
QUESTIONS:
1. Which ester combinations do you have duplicated within your group?
2. Which ones are unique in your group?
3. Which esters can be identified as fruit odors? (This may require using materials other than your text)