Year 12 Practical Investigation Ester Preparation

NAME_

Purpose: To prepare an ester and to purify it.

Materials:

- Quickfit apparatus
- □ measuring cylinders
- □ ethanoic acid (pure)
- □ 1-butanol

Procedure:

Remember to record observations

- 1. Measure 15 mL of the alcohol provided and 10 mL ethanoic acid (pure) into the 50 mL pear-shaped Quickfit flask.
- 2. Slowly add about 1 mL concentrated sulfuric acid and a few boiling chips.
- 3. Assemble the glassware for reflux.
- 4. Reflux the mixture for 20 minutes, adjusting the flame to ensure smooth boiling.
- 5. Allow flask and contents to cool.
- 6. Pour the **cooled** mixture into a separating funnel, which contains about 20 mL of water. Shake and allow the layers to separate. Check which is the aqueous layer.
- Collect the organic layer and wash it with about 20 mL of sodium carbonate solution.
 Repeat this step until no more effervescence occurs. Take care with this step as pressure is built up due to carbon dioxide release.
- 8. Collect the organic layer. Record the appearance and odour.

Write a report with the following sections:

- Introduction
 - Using the library and/or internet, write a 350 word introduction discussing at least one issue related to use of esters in society.
- Observations
 - Reflux (before, during and after)
 - Isolation (with water and sodium carbonate)
 - Product
- Discussion
 - Write an annotated structural formula equation for the formation of the ester
 - Name the ester
 - Explain the purpose of refluxing
 - Explain the isolation procedure
 - Suggest why a poor yield is produced

- □ concentrated sulfuric acid
- $\hfill\square$ boiling chips
- **\square** 20 mL sodium carbonate solution (0.1 mol L⁻¹)