1. The functional group of a carboxylic acid is:

   ☐ –OH

   ☐ –COOH (carboxyl)

   ☐ –COO–

   ☐ C=O alone

2. What catalyst is used in Fischer esterification?

   ☐ Yeast

   ☐ Iron

   ☐ Concentrated sulfuric acid

   ☐ Sodium hydroxide

3. A carboxylic acid is made by oxidising a primary alcohol or aldehyde, using:

   ☐ distillation to stop early

   ☐ acidified dichromate with reflux

   ☐ a tertiary alcohol

   ☐ no heating

4. Esterification is a condensation reaction that releases water.

   ☐ True ☐ False

5. A carboxylic acid added to a carbonate gives a salt, water and:

   ☐ ammonia

   ☐ carbon dioxide

   ☐ oxygen

   ☐ hydrogen

6. How can the yield of an ester be increased?

   ☐ Use excess alcohol

   ☐ Remove the catalyst

   ☐ Cool to 0 °C

   ☐ Add more water

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☐ True ☐ False

8. Soap is made by alkaline hydrolysis of fats.

   ☐ True ☐ False

9. A carboxylic acid reacting with an alcohol (conc. H_2SO_4 catalyst) makes:

   ☐ an ester

   ☐ an amine

   ☐ a nitrile

   ☐ an alkene

10. What is the ester formed from methanol and ethanoic acid?

    ☐ Ethyl methanoate

    ☐ Methyl ethanoate

    ☐ Ethyl ethanoate

    ☐ Methyl methanoate

1. **–COOH (carboxyl)**

   Carboxylic acids contain the –COOH group and behave as weak acids.

2. **Concentrated sulfuric acid**

   A little strong acid.

3. **acidified dichromate with reflux**

   Reflux ensures full oxidation all the way to the carboxylic acid (distillation would stop at the aldehyde).

4. **True**

   A small molecule is lost.

5. **carbon dioxide**

   Like other acids, it releases CO_2 from a carbonate – the fizz is a useful test.

6. **Use excess alcohol**

   The equilibrium moves right.

7. **True**

   A test for the –COOH group.

8. **True**

   Fats are esters of glycerol.

9. **an ester**

   Esterification joins the acid and alcohol into an ester (losing water).

10. **Methyl ethanoate**

    Alcohol part first, -oate second.

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