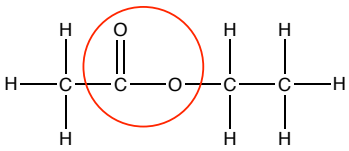
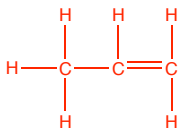
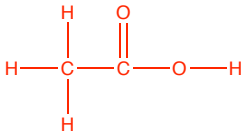
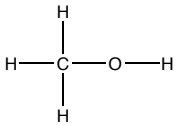
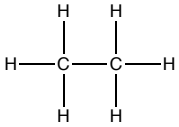
1 Ethyl ethanoate is an ester made by reacting ethanol with ethanoic acid in the presence of concentrated sulfuric acid.



a Draw a ring around the functional group in the ester.

b Give the role of the concentrated sulfuric acid. **catalyst**

2 Complete this table with the names, structures and functional groups of some organic compounds.

displayed formula				
name	propene	ethanoic acid	**methanol**	**ethane**
functional group	**C=C (alkene)**	**-COOH (carboxylic acid)**	**-OH (alcohol)**	**none (alkane)**

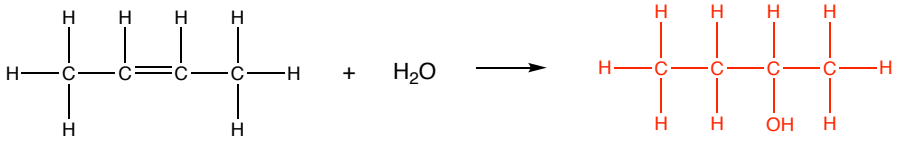
3 Identify the functional group in each of the following organic compounds.

molecule	add bromine water	add sodium	add sodium carbonate	is it miscible with water?	functional group
A	yellow-orange	fizzes	no reaction	✓	**-OH (alcohol)**
B	colourless	no reaction	no reaction	×	**C=C (alkene)**
C	yellow-orange	fizzes	fizzes	✓	**-COOH (carboxylic acid)**

4 Butene reacts with steam in the presence of concentrated phosphoric acid at high temperature and pressure to form an alcohol.

a Give two names for the type of reaction taking place. **addition & hydration**

b Complete the equation for this reaction.



c Give two potential uses for the alcohol formed.

1 **solvent**

2 **fuel**