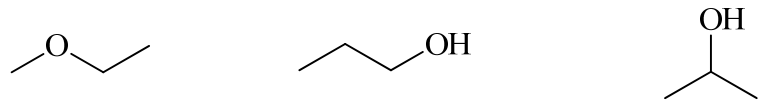
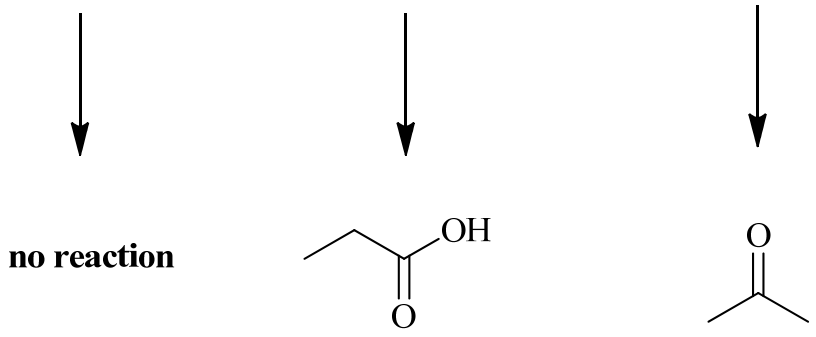
Marks 5

- Compound **X** is known to have the molecular formula C_3H_8O. Draw the constitutional formulas of the three possible isomers that could be compound **X**.



Compound **X** reacts with acidified potassium dichromate solution to give compound **Y**. Give the possible structure(s) of compound **Y**.



propionic acid (or propanoic acid)

acetone

Describe a simple **chemical test** that could be used to identify compound **Y**. Give the reagent(s) used and any expected observation(s).

Propionic acid is an acid and acetone is not. Any reaction that detects the presence of an acid – such as simple addition of universal indicator – would be able to identify whether propionic acid or acetone is present.

An alternative is addition of $NaHCO_3$(aq). The propionic acid will react to produce bubbles of CO_2. Acetone will not react.