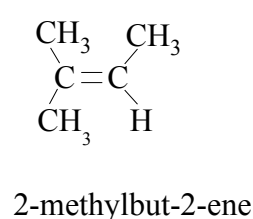
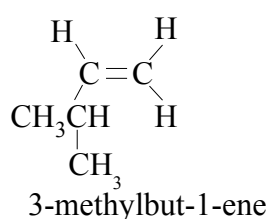
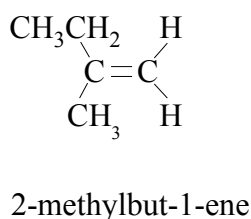
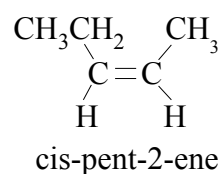
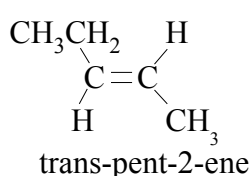
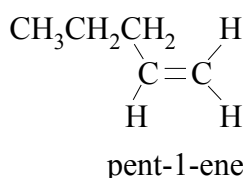


Chemguide – questions

ALKENES: REACTIONS WITH POTASSIUM MANGANATE(VII)

- Potassium manganate(VII) solution (potassium permanganate solution) reacts with ethene in the cold. The colour change depends on whether you use the potassium manganate(VII) in acidic or mildly alkaline solution. Describe the colour change in the potassium manganate
 - under acidic conditions;
 - under alkaline conditions.
 - What is the organic product of the reaction?
 - Showing the oxidising agent simply as [O], write the equation for the reaction between propene and alkaline potassium manganate(VII) solution in the cold.
- Some sources include this reaction as a way of testing for C=C double bonds. Why is this *not* a satisfactory test for a C=C double bond?
- Don't waste time on this question unless your syllabus specifically asks you to know and understand the reaction between complex alkenes and hot concentrated potassium manganate(VII) solution. As far as I know, of the UK-based examination boards, only Cambridge International (CIE) expects you to know it.

The isomers of C₅H₁₀ containing a C=C double bond are:



Each of these isomers was treated with hot concentrated potassium manganate(VII) and the products analysed. There were four different results from the six isomers, labelled below as A, B, C and D. Obviously, in some cases, more than one isomer gave the same results.

Use the information below to work out the name(s) of the isomers giving each of the results A, B, C and D

Chemguide – questions

The products in result A were a ketone with the molecular formula C_4H_8O and the gas CO_2 .

The products in result B were a carboxylic acid CH_3COOH and a ketone C_3H_6O .

The products in result C were a carboxylic acid C_3H_7COOH and the gas CO_2 .

The products in result D were two carboxylic acids C_2H_5COOH and CH_3COOH .

When you have finished, you should have tied every one of the six isomers to a result.