

Do now:

What are the lab rules we should follow in F4 when carrying out a lab?

Lab rules

- No eating/no drinking
- Safety glasses on
- Wash hands when leaving
- Bags under desk
- Walking only/no running
- No drinking chemicals
- Follow instructions

Do now:

Complete the questions on the lab worksheet from Friday about alkanes and alkenes

Learning Objectives

- Explain the similarities and differences in the physical and chemical properties of alkanes and alkenes
- Write equations for the common reactions of alkanes and alkenes
- Recognise the difference between *substitution* and *addition* reactions and explain the reasons why each one occurs
- Identify the major and minor products formed from the addition reactions of asymmetric alkenes with asymmetric reagents

Alkanes and Alkenes

What can you remember about the properties and reactions of alkanes and alkenes from last year?

Properties

Solubility in water Not soluble in water, non-polar

Boiling point, melting point Low melting and boiling points

Reactions

Alkanes Substitution reactions

Alkenes Addition reactions, oxidation reactions

Types of reactions

There are 6 different types of reactions organic compounds can undergo.

Substitution

Addition

Elimination

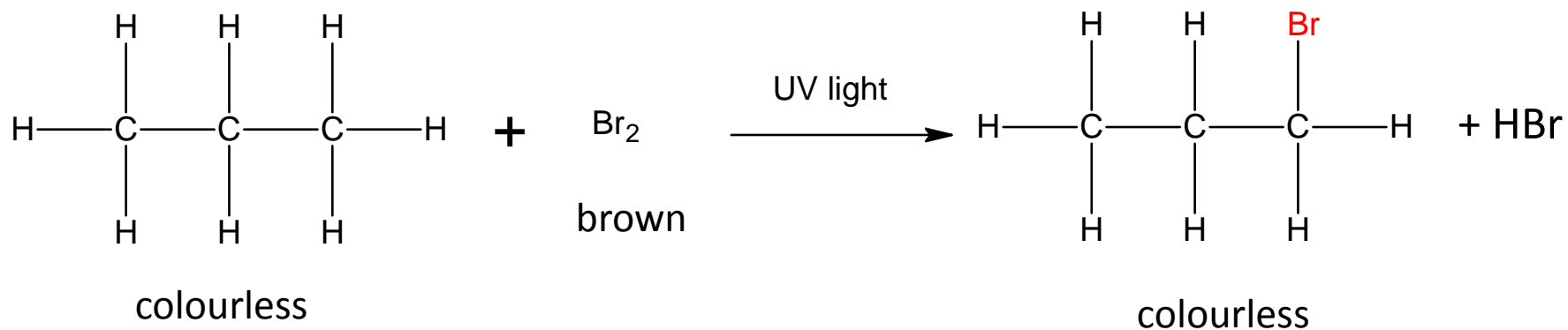
Oxidation

Reduction

Acid-base

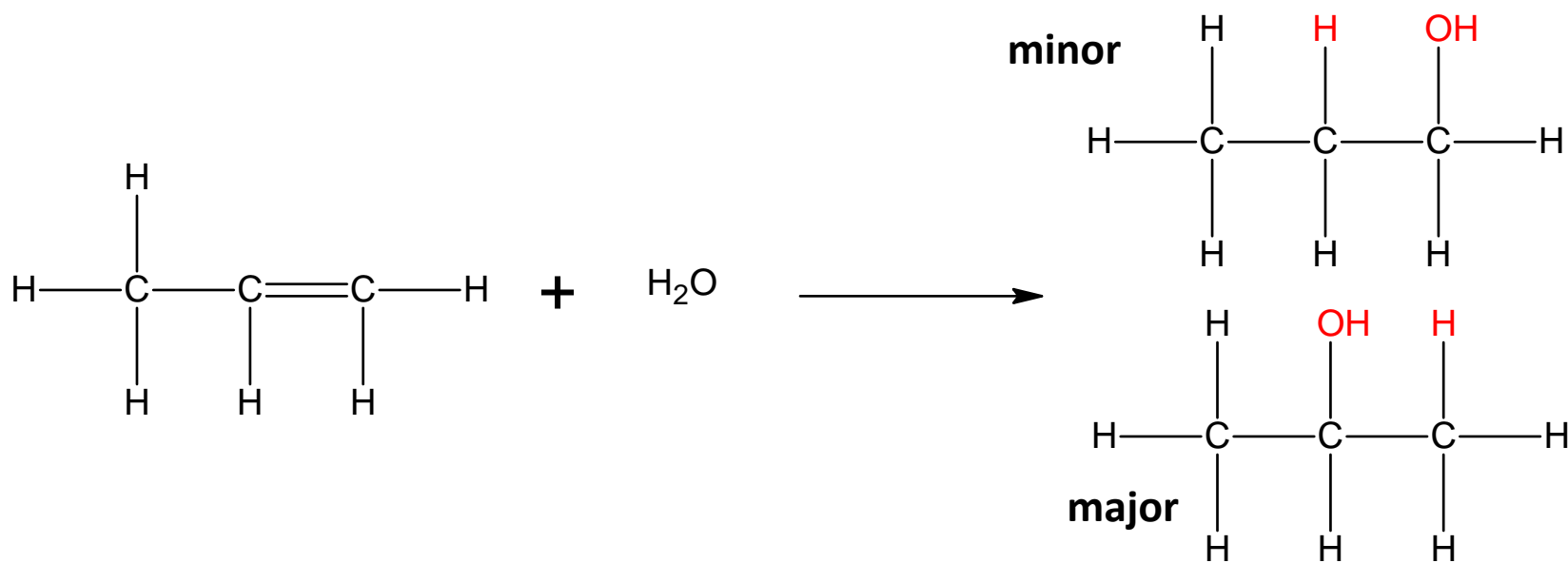
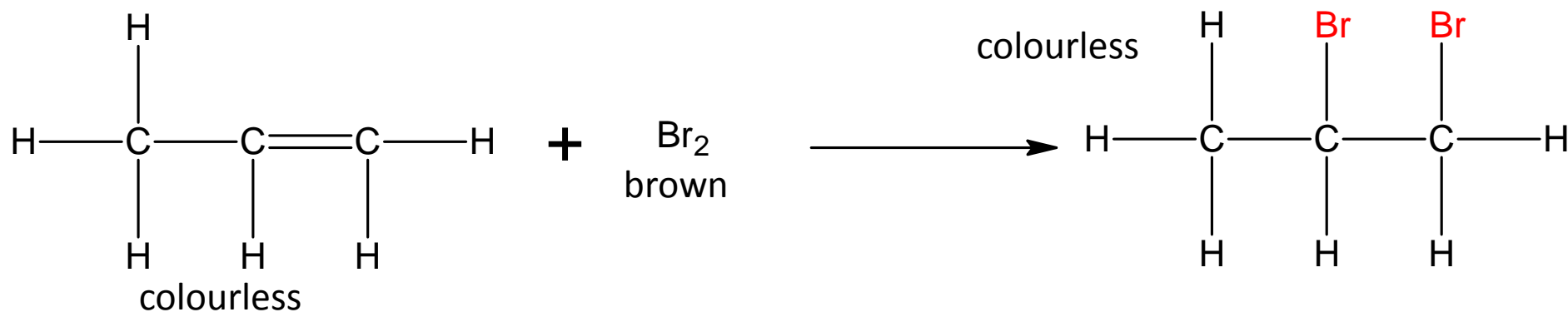
Reactions of alkanes

Substitution to form haloalkanes, using X_2 , where X is a halogen (Cl, Br, I).



Reactions of alkenes

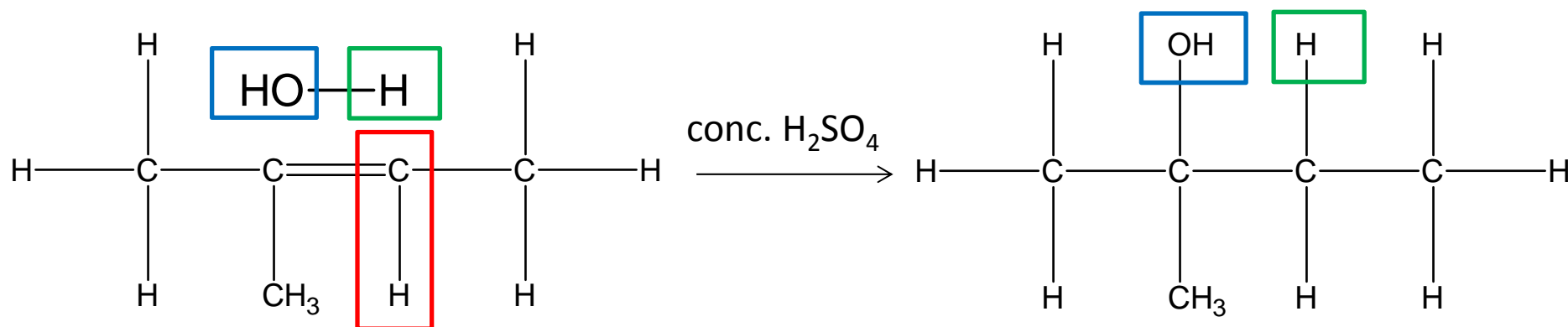
Addition to form haloalkanes, using X_2 , where X is a halogen (Cl, Br, I) and addition to form alcohols using H_2O (*steam*).



Markovnikoff's Rule

When an asymmetrical alkene and an asymmetrical reactant undergo an addition reaction two possible products can be formed.

The preferred product (major product) is the one where the hydrogen atom of the reagent is added to the carbon atom in the double bond that is already attached to the most hydrogens – this is Markovnikoff's Rule.



Markovnikoff's Rule

Complete the following reactions. If there are two possible products that can be formed, identify which product is the major product and which product is the minor product.

