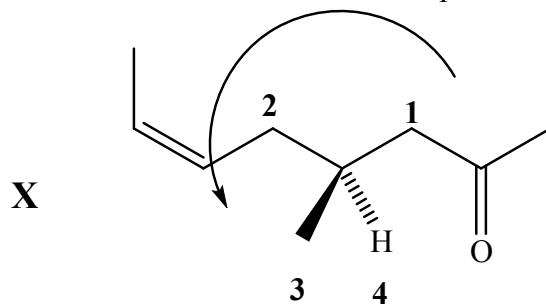


- Compound **X** was isolated as a derivative of a natural product.

Marks
6



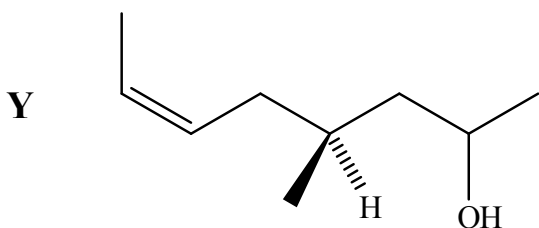
Carbon 4 of **X** is a stereogenic centre. List the substituents attached to C4 in descending order of priority according to the sequence rules.

highest priority		lowest priority	
$-\text{CH}_2\text{COCH}_3$	$\text{CH}_2\text{CH}=\text{CHCH}_3$	$-\text{CH}_3$	$-\text{H}$

What is the systematic name for compound **X**? Make sure you include all relevant stereochemical descriptors.

(4*S*,6*Z*)-4-methyloct-6-en-2-one. As shown above, the stereochemistry about carbon 4 is (*S*) (anticlockwise). The C=C bond has the two higher priority groups ($-\text{CH}_3$ and $-\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{COCH}_3$) on the same side so it has a (*Z*) configuration.

Reduction of **X** with sodium borohydride (NaBH_4) followed by quenching the reaction with dilute acid gives **Y**. Give the constitutional formula for **Y**.



Product **Y** can be separated into two isomers. Explain.

The reduction introduces a second stereogenic centre into the molecule. The two products are diastereoisomers (not enantiomers) and hence have different chemical and physical properties and can be separated.

