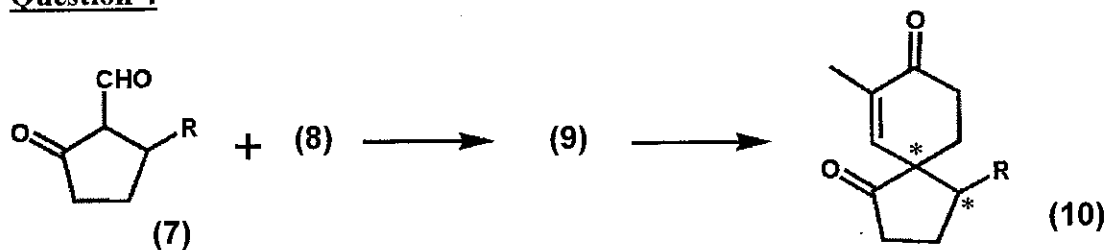
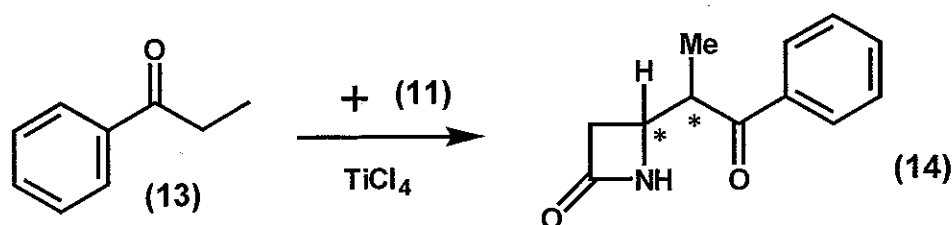
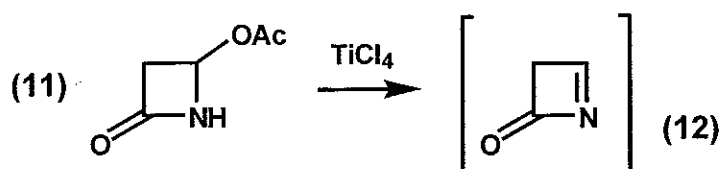


Question 4

The ketoaldehyde (7) reacts with compound (8) to give an intermediate (9). Under basic conditions, compound (9) is converted to the spiro-compound (10).

- Propose structures for (8) and (9). Suggest reagent(s) and condition(s) for the preparation of (9).
- The relative stereochemistry at carbon atoms marked * in (10) is in fact established in the formation of (9). Give an explanation to the observed stereochemistry in (9).
- Show the mechanism for conversion of (9) to (10). What are the two other possible products? Why is their formation not favoured?

[20 marks]

Question 5

When 4-acetoxycyclobutylamine (11) is treated with a strong Lewis acid, it would eliminate AcOH to give the reactive intermediate (12). When a mixture of (11) and ketone (13) is treated with TiCl_4 , the adduct (14) is formed. Show a mechanism of the reaction to derive the stereochemistry at the carbon atoms marked * in (14).

[10 marks]