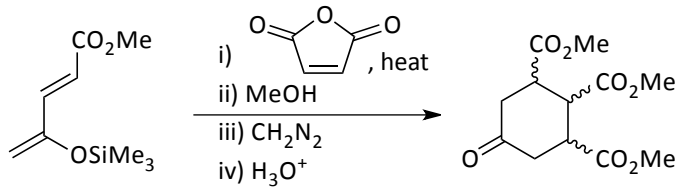
Practice Problems Relating to Pericyclic Reactions

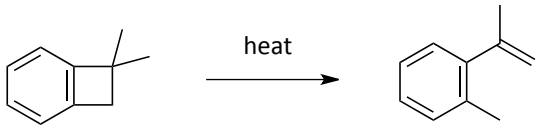
All of the following reactions involve at least one pericyclic process (a number of the problems involve multiple pericyclic processes).
In each case:

i) provide a mechanism for the reactions
ii) identify the pericyclic process or processes
iii) assign them to their class
iv) show they are allowed using either the Woodward-Hoffmann rules or an FMO analysis
v) Predict the stereochemical outcome of the reaction where it is not shown (wavy bond) or rationalise the stereochemical outcome where it is shown.

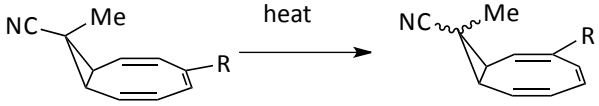
1)



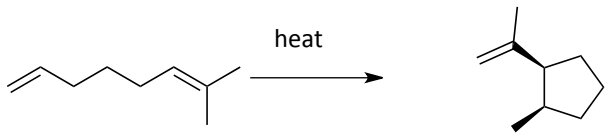
2)



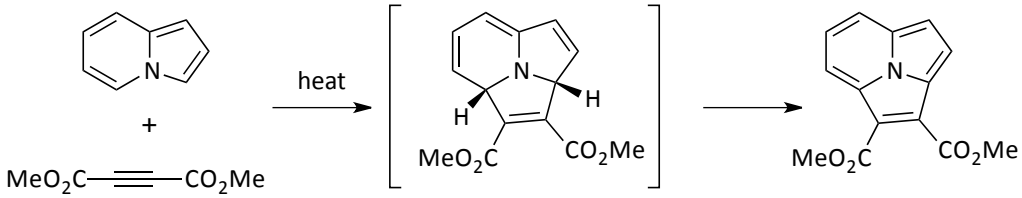
3)



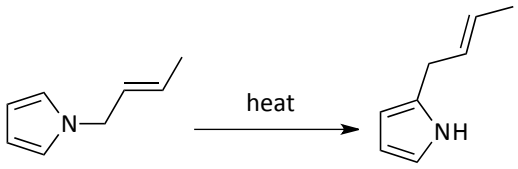
4)



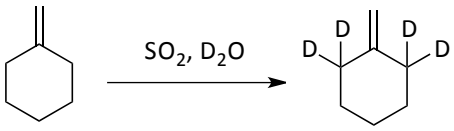
5)



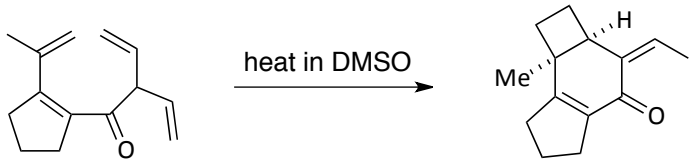
6)



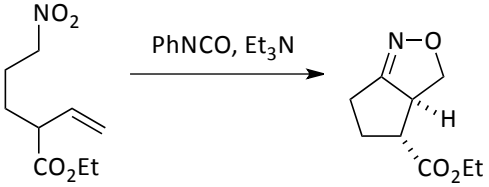
7)



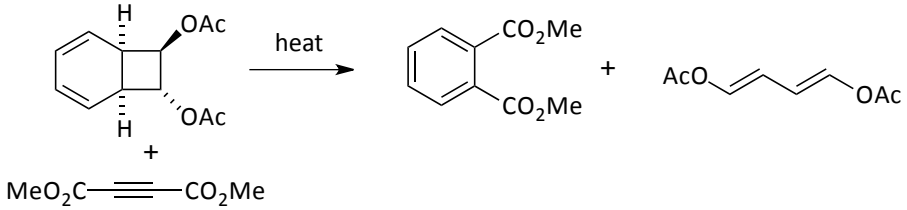
8)



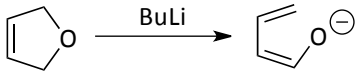
9)



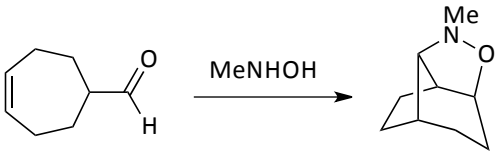
10)



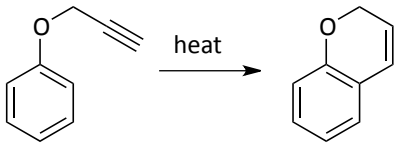
11)



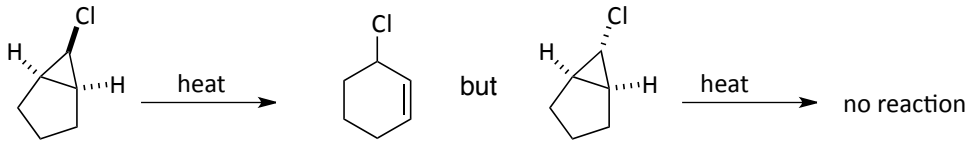
12)



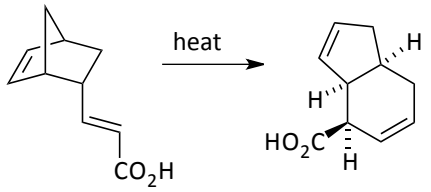
13)



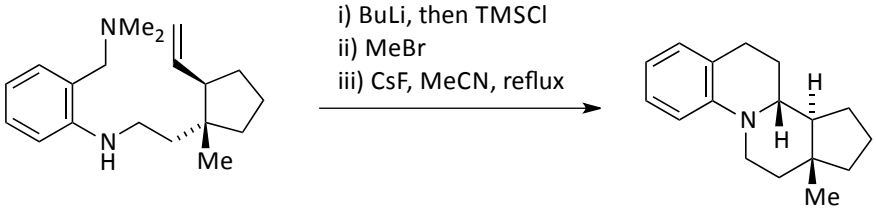
14)



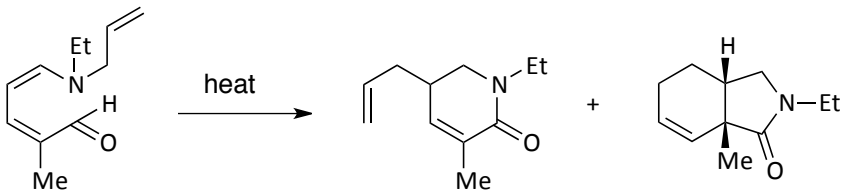
15)



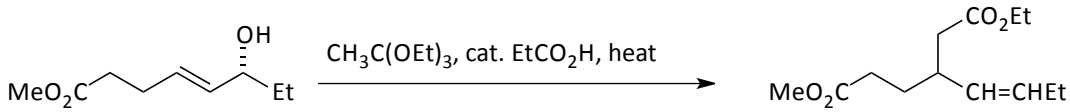
16)



17)



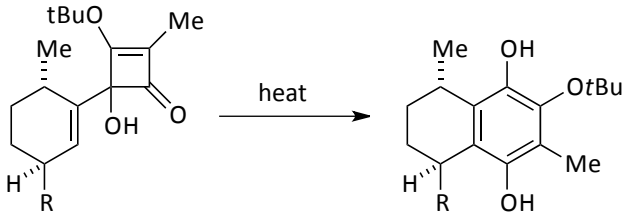
18)



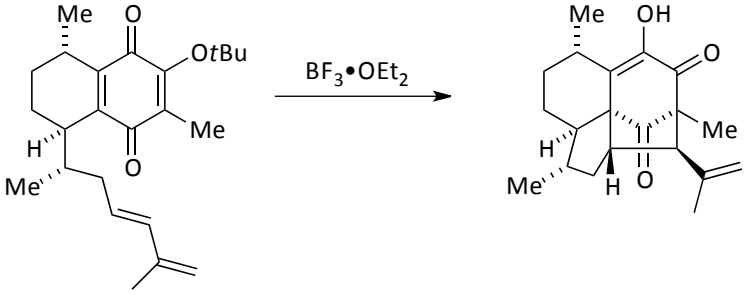
single enantiomer

single enantiomer and single alkene isomer

19)



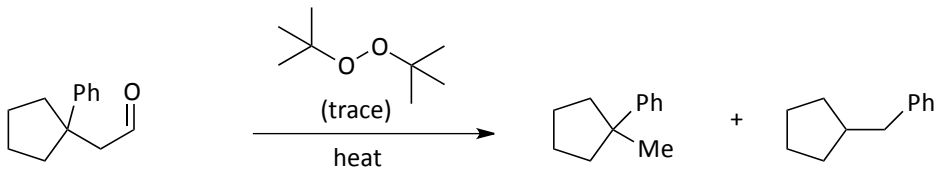
20)



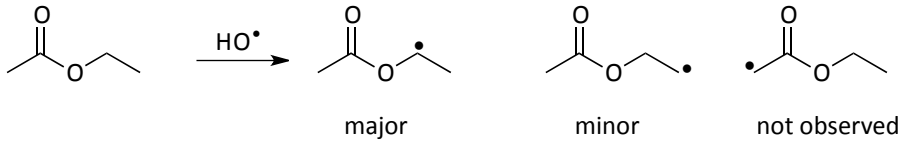
Practice Problems Relating to Radical Reactions

Provide mechanisms for the following reactions. In each case explain the selectivity of the reaction in as much detail as possible.

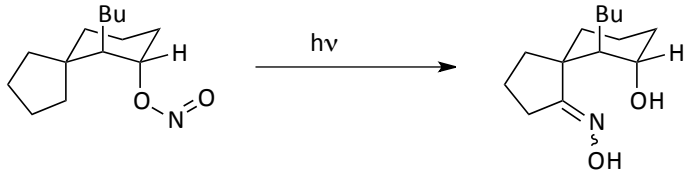
1)



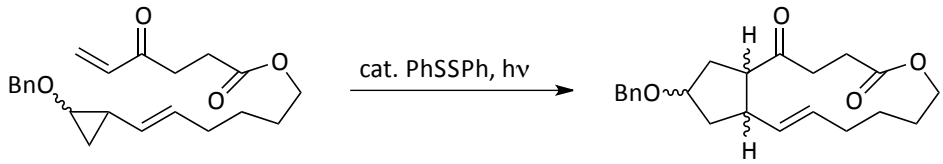
2)



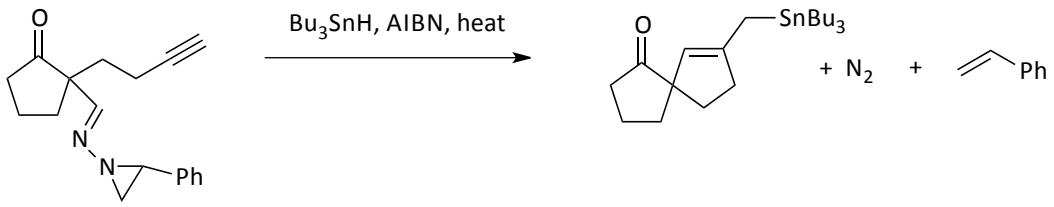
3)



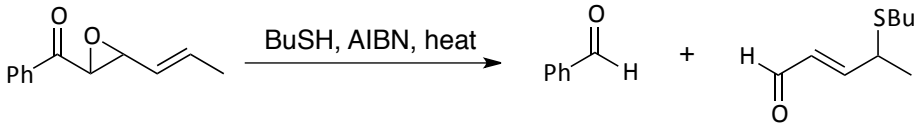
4)



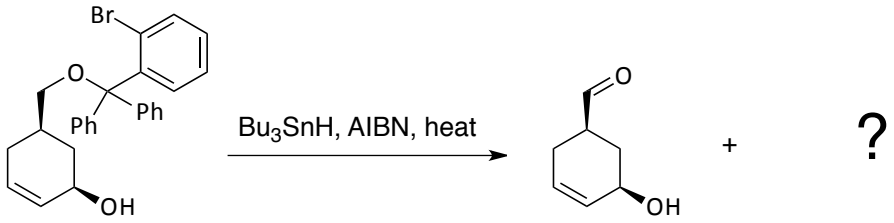
5)



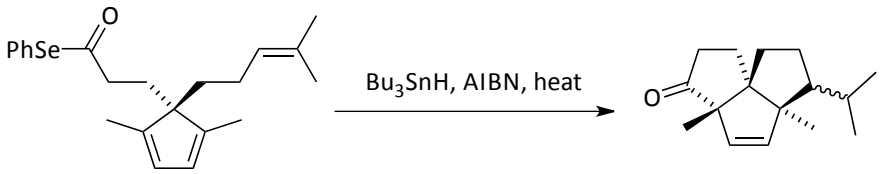
6)



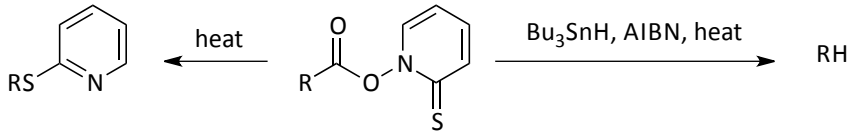
7)



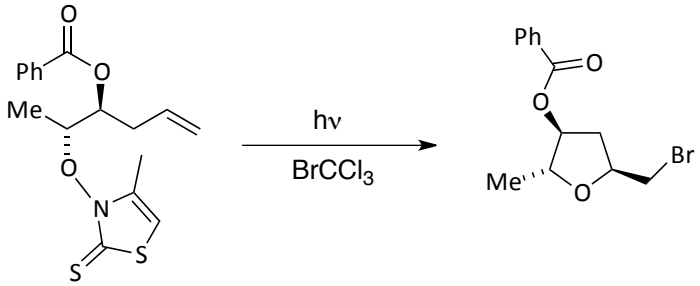
8)



9)



10)



Bibliography for Radical Reactions

■ *Reactive Intermediates*, Oxford Chemistry Primer no. 8; Christopher Moody and Gordon Whitham
■ *Organic Chemistry* Jonathan Clayden, Nick Greeves, Stuart Warren, Peter Wothers
■ *Frontier Orbitals and Organic Chemical Reactions*; Ian Fleming
■ *Molecular Orbitals & Organic Chemical Reactions*; Ian Fleming
■ *Rearrangements and Reactive Intermediates – Lecture notes and problems*; Harry Anderson

Problems and complete filled in handout available at:
http://burton.chem.ox.ac.uk/teaching.htm