No. of Printed Pages : 5

RCHE-001

Ph. D. (CHEMISTRY)/M. Phil. (CHEMISTRY) (PHDCHEM/MPHILCHEM)

Term-End Examination

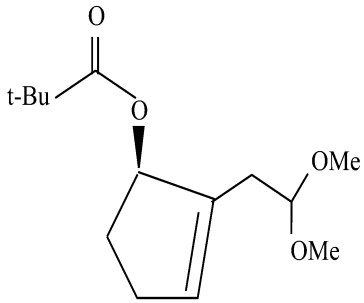
June, 2022

RCHE-001 : ADVANCES IN ORGANIC CHEMISTRY

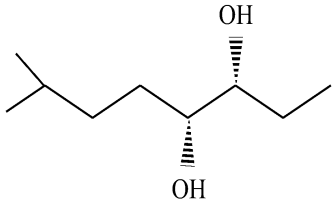
Time : 3 Hours *Maximum Marks : 100*

Note : *Answer* ***all*** *questions.*

1. Suggest synthesis of a single enantiomer of any ***one*** of the following compounds : 10



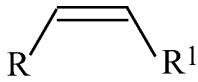
Or

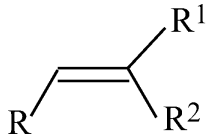


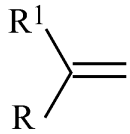
Write the name and structure of the reagent responsible for the asymmetric synthesis step.

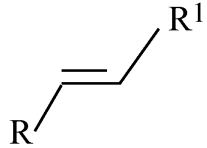
2. What are microwave assisted chemical reactions ? How do microwaves help in speeding up the reactions ? Explain with the help of an example. 10

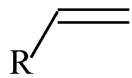
3. What are the advantages of homogeneous catalysis over heterogeneous catalysis ? Arrange the following alkenes in the order of decreasing reactivity towards homogeneous catalytic hydrogenation : 10

(i) 

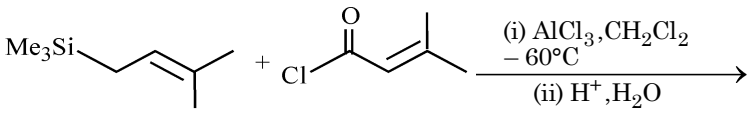
(ii) 

(iii) 

(iv) 

(v) 

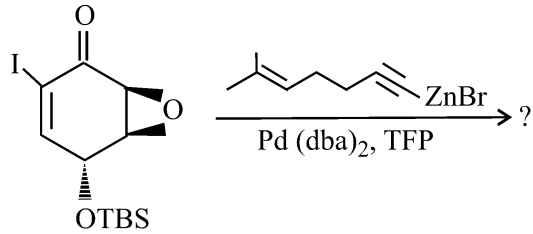
4. Compare the stability of allylsilanes with lithium or boron allylic species towards organic synthesis. Complete the following reaction and give its mechanism : 10



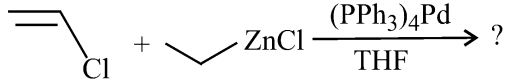
5. What are the challenges in carrying out solventless reactions especially in the context of organic synthesis ? Giving complete reaction conditions, write ***two*** reactions that can be performed solvent free. 10

6. Write the product in any ***one*** of the following complete reactions : 10

(a)

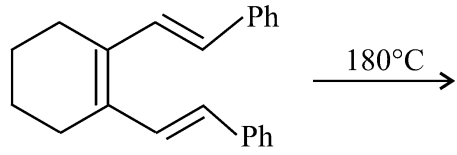


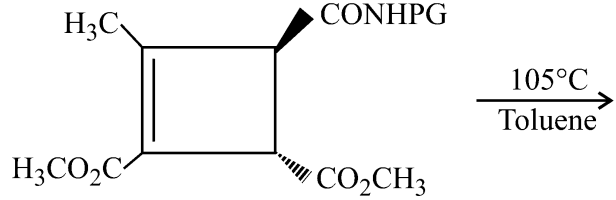
(b)



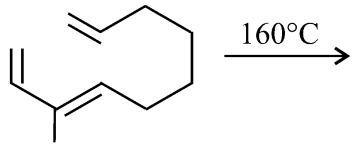
7. Draw the MO correlation diagrams for the electrocyclic reaction of 1, 3-butadiene for symmetry forbidden disrotatory and symmetry allowed conrotatory reactions. 10

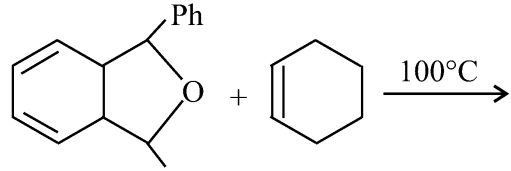
8. Complete the following reactions : 5×2=10

(a) 

(b) 

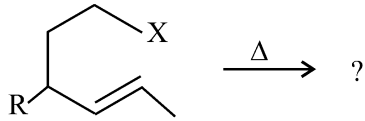
(c) $R_2\bar{C} - \overset{+}{N} \equiv N + RCH = CHR \xrightarrow{\Delta}$

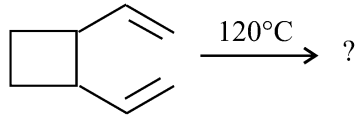
(d) 

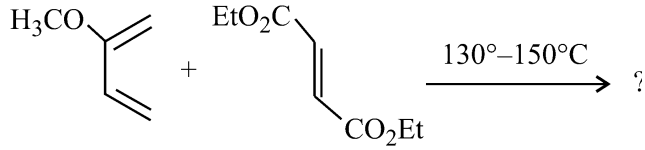
(e) 

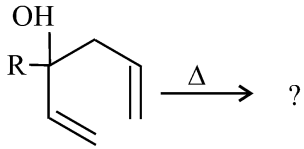
9. Taking suitable examples, discuss the forces that are responsible for supramolecular assemblies. 10

10. Complete the following reactions : 5×2=10

(a) 

(b) 

(c) 

(d) 

(e)