

KATHMANDU UNIVERSITY
End Semester Examination [C]
June, 2018

Marks Scored:

Level : B.E./B.Sc./B.Pharm.

Year : II

Exam Roll No. :

Time: 30 mins.

Course : CHEM 201

Semester : I

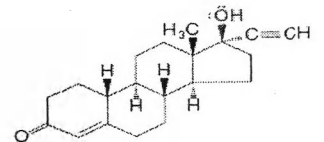
F. M. : 20

Registration No.:

Date JUN 14 2018

SECTION "A"

[20 Q. × 1 = 20 marks]



Select the most appropriate answer.

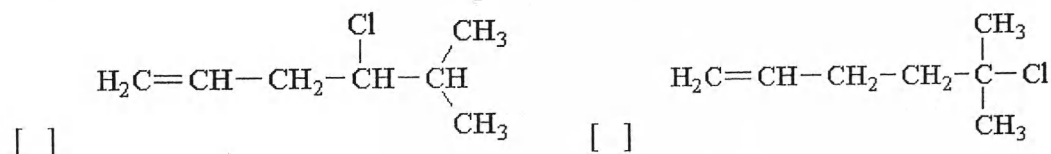
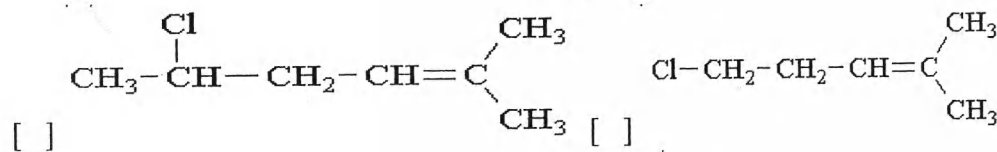
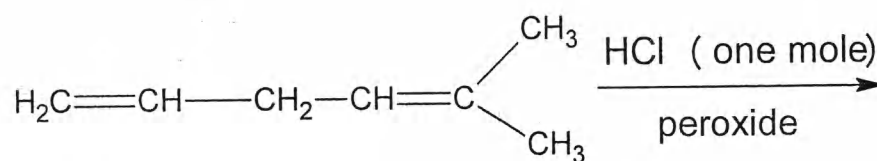
1. How many chiral centres are there in the given molecule?

3 4 5 6

2. The observed rotation of an optically active compound is 4.42° when kept in a polarimeter of sample tube of 10 cm. What is the specific rotation of that compound if the concentration of the sample is 0.1 gm/L?

$+4.42^\circ$ $+44.2^\circ$ $+442^\circ$ $+0.442^\circ$

3. What is the major product obtained from the following reaction?



4. The disubstituted benzene hasisomeric form

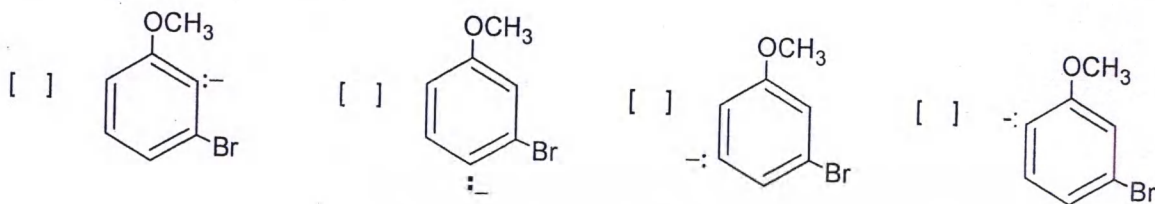
1 2 3 4

5. E1 reaction is favored on.....by.....

a. Tertiary haloalkanes b primary haloalkanes
c. weaker base d. stronger base
 ac bd ad bc

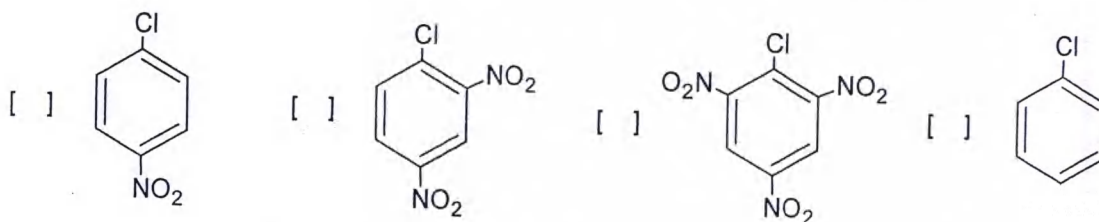
6. Which of the following reaction proceeds with Markovnikov's orientation?
- | | |
|--|-----------------------------|
| a. Oxymercuration-demercuration | c. Hydroboration-oxidation |
| b. Free radical polymerization of alkenes. | d. Dimerization of alkenes |
| <input type="checkbox"/> ab | <input type="checkbox"/> bc |
| | <input type="checkbox"/> ca |
| | <input type="checkbox"/> da |

7. The most stable intermediates among the given is



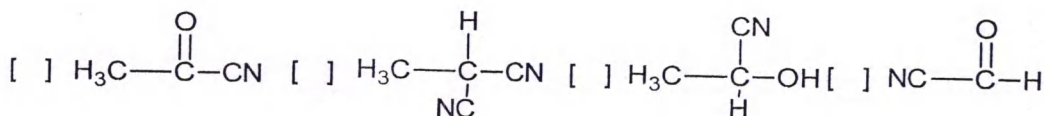
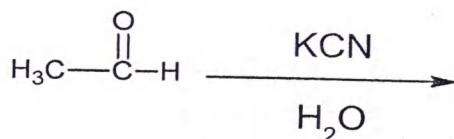
8. In electrophilic aromatic substitution reactions the $-\text{COOH}$ group is:
- an o,p-director since it stabilizes the ortho, para position less than the meta.
 a m-director since it destabilizes the meta position less than the ortho, para.
 an o,p-director since it stabilizes the ortho, para position more than the meta.
 a m-director since it destabilizes the meta position more than the ortho, para.

9. The most reactive substrate towards nucleophilic aromatic substitution is



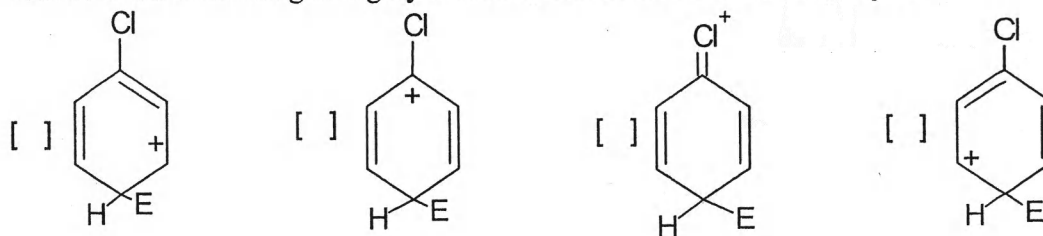
10. Which of the following solvent is highly favorable for the $\text{S}_{\text{N}}1$ reaction?
- | | |
|--|---|
| <input type="checkbox"/> Water | <input type="checkbox"/> Ethanol |
| <input type="checkbox"/> Dimethylsulfoxide | <input type="checkbox"/> Trifluoroethanol |

11. What is the correct product of the reaction?

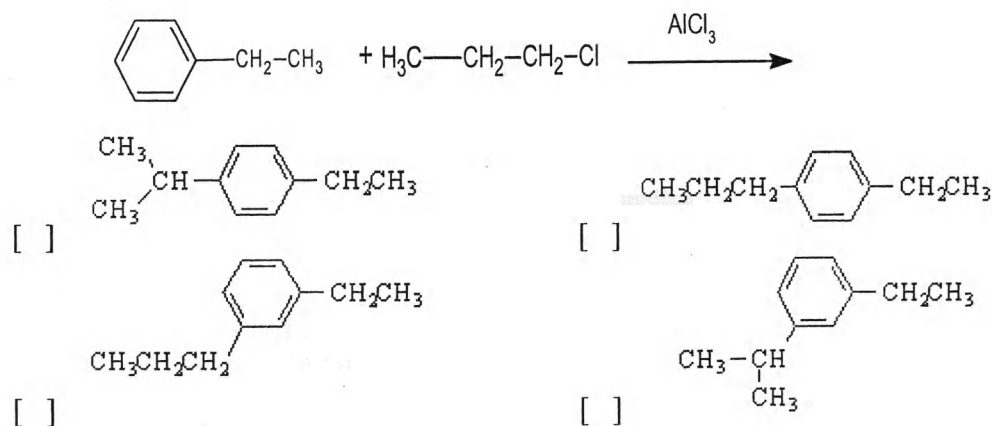


12. The orientation of free-radical addition doesn't depend on
- | | |
|---------------------------------------|--|
| <input type="checkbox"/> Polar factor | <input type="checkbox"/> Steric factor |
| <input type="checkbox"/> ionic nature | <input type="checkbox"/> stability of free radical |

13. Which of the following is highly unstable form? Here E is an electrophile

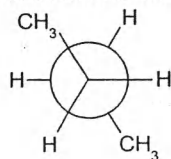


14. What is the product for the following reaction



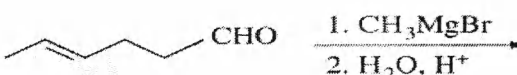
Fill in the blanks.

15. The order of reactivity of halides (F-, Cl-, Br-, I-) in nucleophilic substitution reaction as a nucleophile iswhen the solvent used is methanol.
16. The chair form structure of trans 1,2-dimethylcyclohexane is.....
17. On rotation of 180° of sigma bond of carbon-2 and carbon-3 gives the

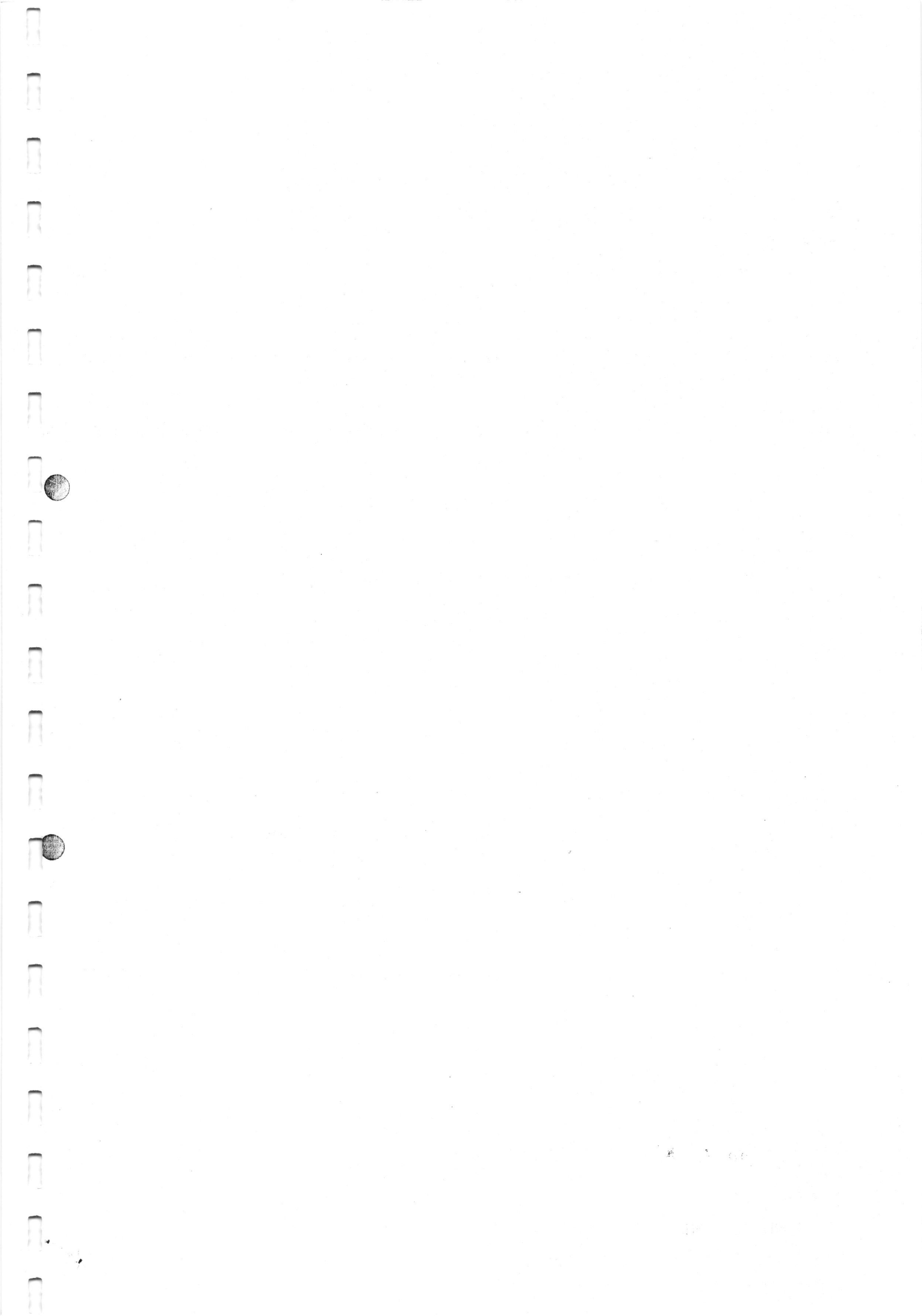


.....(write Newman projection)

18. A compound 2,3- Dichlorobutane has a meso structure. The configuration of the chiral centres of that mesocompound is.....

19. The major product of the reaction is.....
- 

20. The Difference in the potential energy of half-chair and the twisted-boat form is



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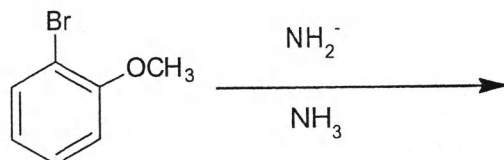
Course : CHEM 201
Semester : I
F.M. : 55

SECTION "B"

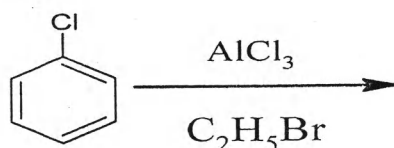
1. Give the mechanism for:

[2.5 × 4 = 10]

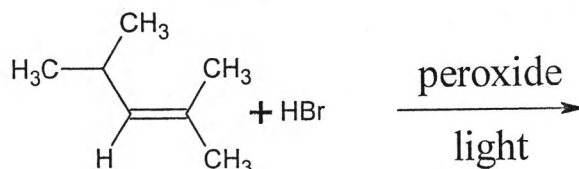
a.



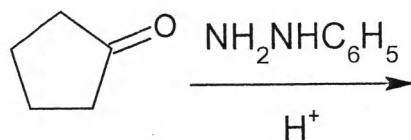
b.



c.



d.



2. Give the appropriate explanation for the following facts.

[2.5 × 4 = 10]

- A strong nucleophile favors the $\text{S}_\text{N}2$ reaction and a weak nucleophile favors the $\text{S}_\text{N}1$ reaction.
- E_2 show a large hydrogen isotope effect
- Twisted boat conformer of cyclohexane is more stable than the boat form.
- In the electrophilic aromatic substitution reaction halogens are deactivating yet ortho,para directing group.

3. Explain the followings.

[2.5 × 4 = 10]

- Conformers of n-butane.
- Generation of chiral center
- Resolution of racemic modification
- Sequence rule

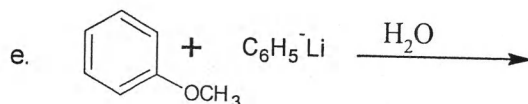
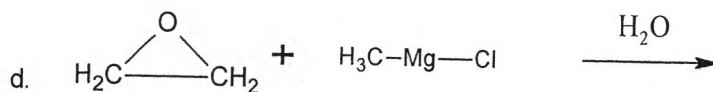
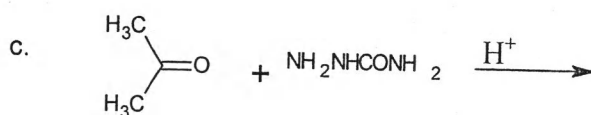
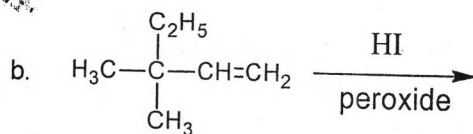
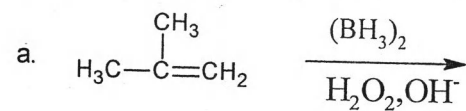
4. Carry out the following conversion.(give reactions)

[2 × 5 = 10]

- Benzaldehyde to Diethyl acetal of benzaldehyde
- 2-Methylpropene to 2,2,4-Trimethylpentane
- Benzene to ortho-Bromonitrobenzene
- Ethene to 2-Bromo-1-Iodoethane
- Ethanal to 2-Methyl-1-Propanol

5. Complete the following reactions.

[1.5 × 5 = 7.5]



6. Write notes on.

[2.5 × 3 = 7.5]

- Structure of Benzene
- Stability of cycloalkanes
- Oxymercuration -demercuration reaction