

CH103 General Chemistry II

2018 Fall semester Quiz 3

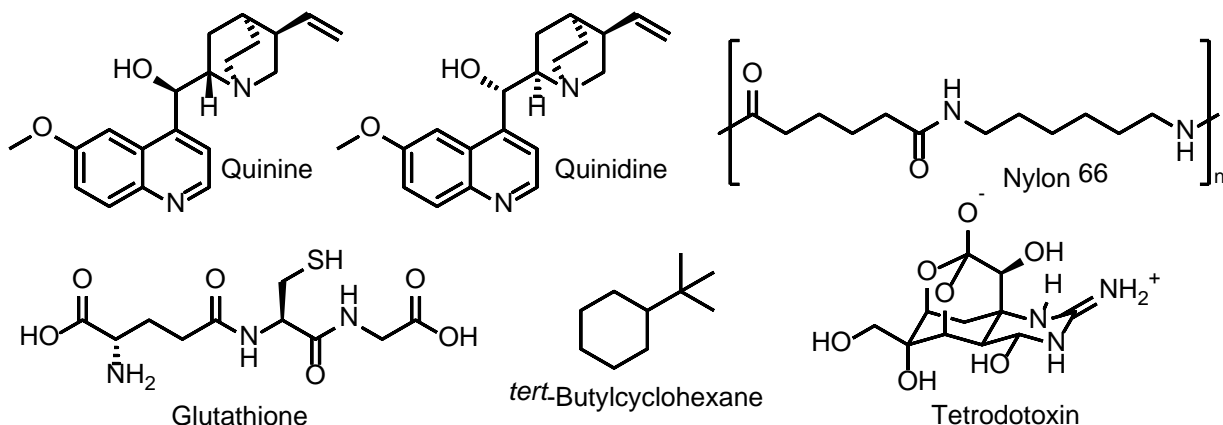
Date: Nov. 12th (Mon)

Time: 19:00~19:45

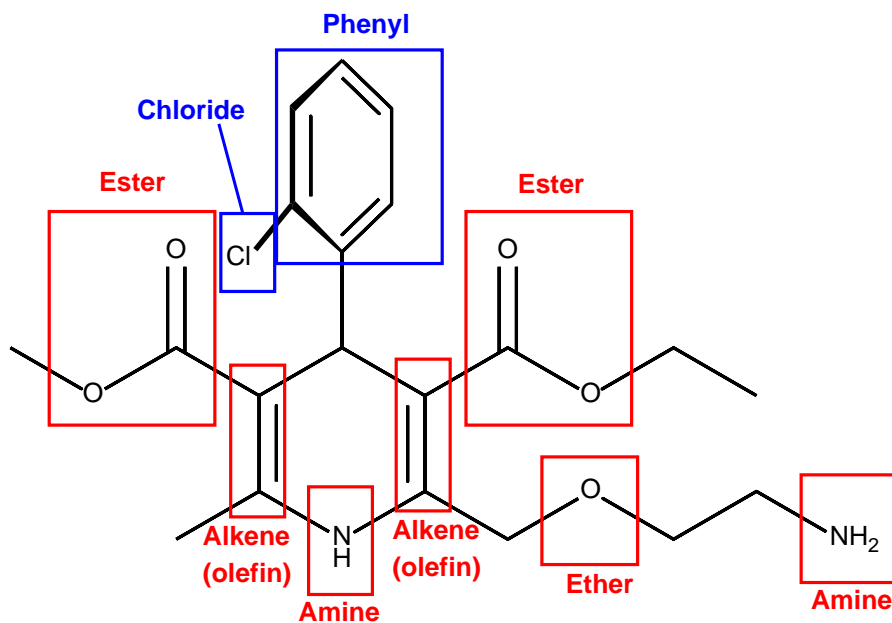
Professor Name	Class	Student I.D. Number	Name

1. Classify each of the following statements as **'True' (T)** or **'False' (F)**. (1 point each, total 12 points)

- The molecular structure of $R^1R^2C=C=CR^3R^4$ is planar. (**F**)
- At 10 % conversion, the fraction of monomer is higher in chain polymerization process compared to step polymerization. (**T**)
- Two enantiomeric compounds have same melting point. (**T**)
- Quinine and Quinidine are enantiomeric to each other. (**F**)
- Monomers in Nylon 66 are connected through ester bond. (**F**)
- High density polyethylene (HDPE) has more branched structure compared to low density polyethylene (LDPE). (**F**)
- Atactic polypropylene lacks the long-range order of the structure. (**T**)
- Glutathione has three other diastereomers (Total four diastereomers are possible as the optical isomer). (**T**)
- In the chair formation of *tert*-butylcyclohexane, the *tert*-butyl group tends to reside in the axial position, not in the equatorial position. (**F**)
- Tetrodotoxin has six chiral centers. (**F**)
- The structure of ...A-A-A-B-B-B-A-A-A-B-B-...belongs to graft polymer. (**F**)
- Cationic chain polymerization utilizes electrophile as the initiator. (**T**)



2. Chemical structure of amlodipine (Norvasc®), a calcium channel blocker for high blood pressure treatment, is shown below.



Blue: Only admitted in this quiz.

Name the functional groups in amlodipine. (2 points each, maximum 6 points)

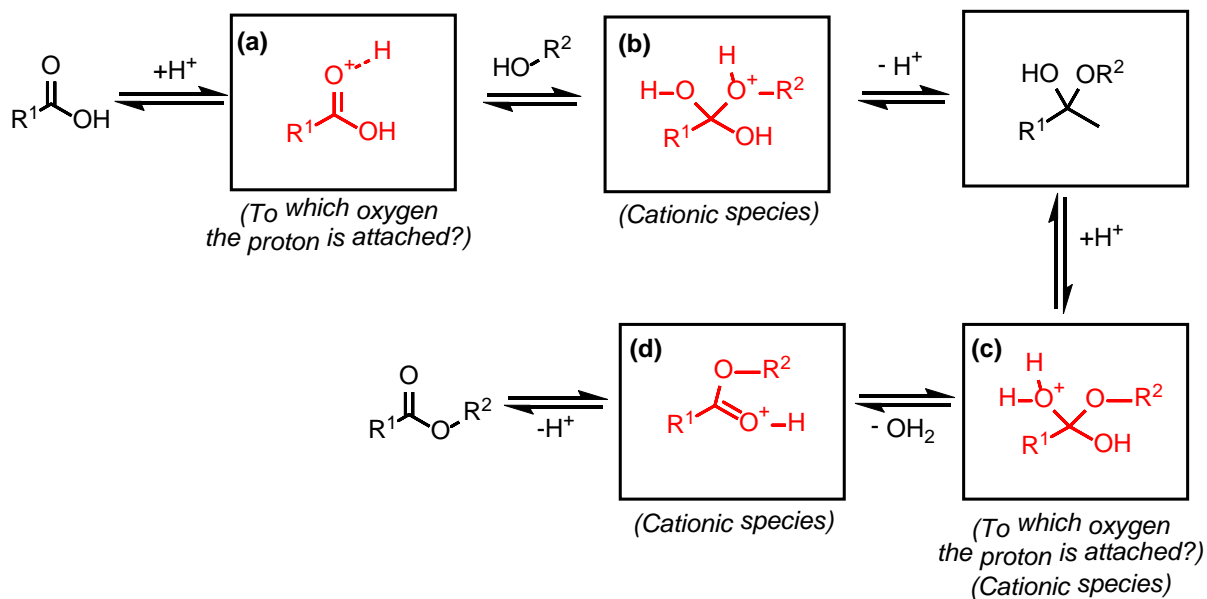
More than 3 functional groups = 6 points.

Designating the *ester* as *ether* is NOT admitted, because their chemical properties are significantly different.

Designating the chloride as chlorine or 'chloro group' is admitted, but 'chloro' is not admitted.

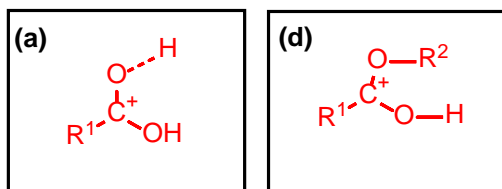
Designating amine as 'amino group' is admitted, but 'amino' is not admitted.

3. The mechanism of acid-catalyzed esterification is shown below. (Total 8 points)

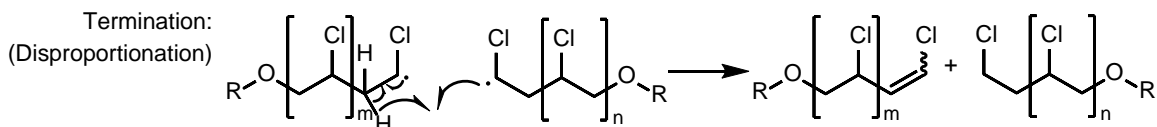
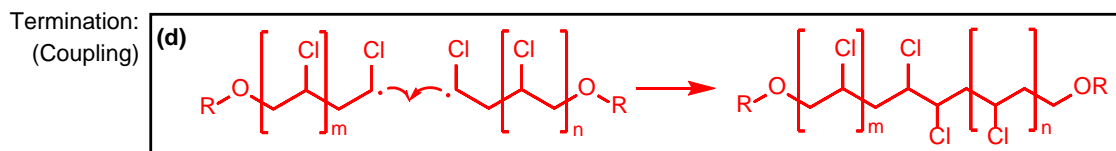
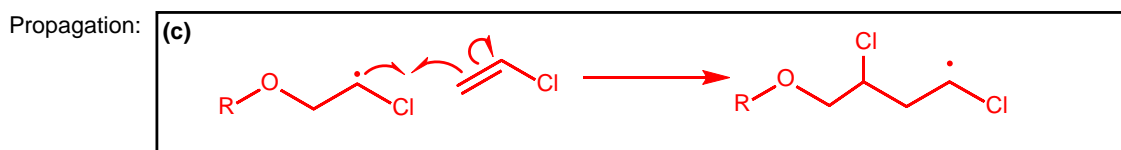
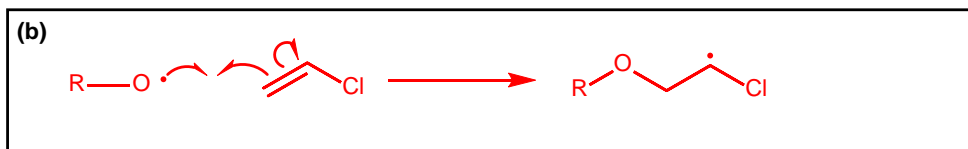
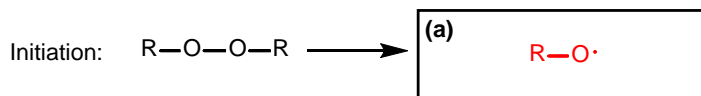


Fill in the blank with appropriate intermediate, referring the hint in each parenthesis (2 points each).

For (a) and (d), followings are also possible answer.



4. The mechanism of polyvinyl chloride (PVC) radical chain polymerization is shown below. (Total 8 points)

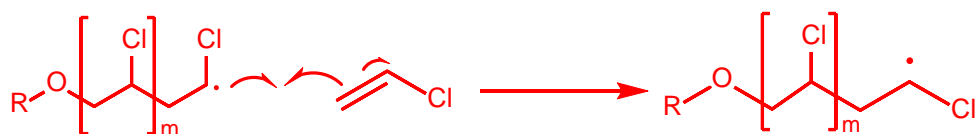


a) Fill in the blank (a) with appropriate intermediate. (2 points)

No partial point.

b) Fill in the blank (b) to (d) with the reaction mechanism of each step including half-arrow for single electron movement. (2 points each)

For propagation step, following is also correct answer.



Without electron arrow, 1 points each.

5. Identify what kind of polymer is obtained by condensation polymerization of the following monomers using the terminologies in the hint (Functional group A can react only with B and vice versa). (Total 6 points)

Hint: Not polymer / Linear / Branched / Cross-linked

a) A-A + B-B (2 points)

Linear

b) A-A + B-B + B₃ (2 points)

Cross-linked

c) A-B + B₄ (2 points)

Branched

cf) The solution is shown below. Not included in the partial point.

