

1. (5 points) For each multiple choice question, pick the most correct answer.

I. A lipid is formed by the condensation reactions between

- A. Carbon and hydrogen
- B. Fatty acids and alcohol
- C. Fatty acids and amino acids
- D. Fatty acids and amines

II. Fats consists of

- A. alcohol linked by ester bonds to 3 fatty acids
- B. glycerol molecule linked by ester bonds to 3 fatty acids
- C. glycerol molecule linked by ester bonds to a fatty acid
- D. glycerol molecule linked by ester bonds to 4 fatty acids

III. Compounds with carbohydrates along with fatty acids are called

- A. Simple lipids
- B. waxes
- C. Glycolipids
- D. phospholipids

IV. Which of the following statement is wrong regarding lipids

- A. Lipids are insoluble in water
- B. Lipids are insoluble in ethanol
- C. Lipids are soluble in benzene
- D. Lipids are insoluble in chloroform

V. The most common monomer of carbohydrate is

- A. nucleotides
- B. glucose
- C. amino acids
- D. maltose

VI. Monosaccharides are

- A. aldoses
- B. ketoses
- C. both a and b
- D. none of these

VII. Carbohydrates occur naturally in

- A. D-form
- B. L-form

- C. Both a and b
- D. None of these

VIII. Which of the following is amino acid has indole ring in its side chain

- A. Phenyl alanine
- B. Tyrosine
- C. Histidine
- D. tryptophan

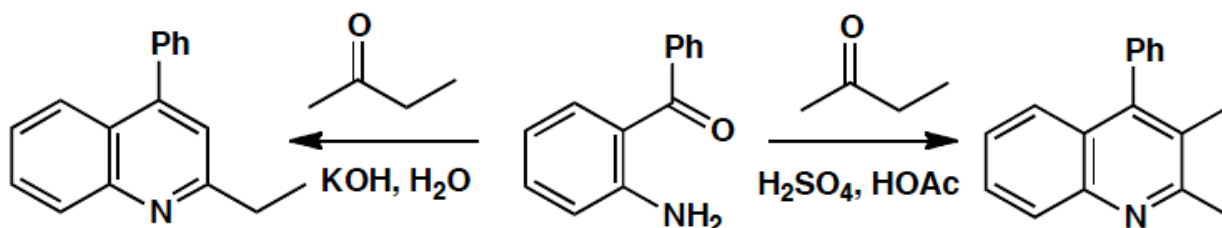
IX. The secondary structure is primarily maintained by

- A. Van der waals force
- B. Hydrogen bond
- C. Ionic bond
- D. Hydrophobic bonds

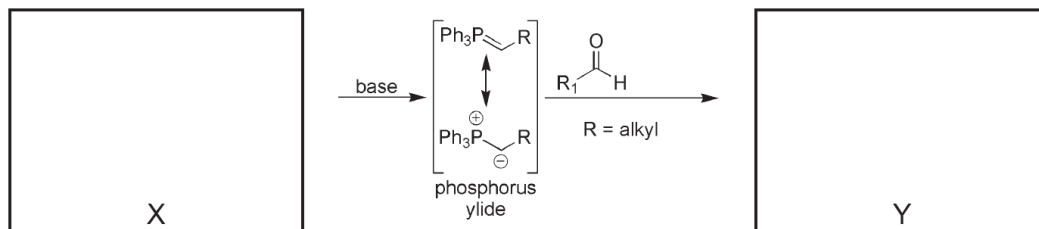
X. The part of a DNA molecule that varies among DNA molecules is its

- A. sugars
- B. phosphates
- C. glycerol
- D. nitrogen bases

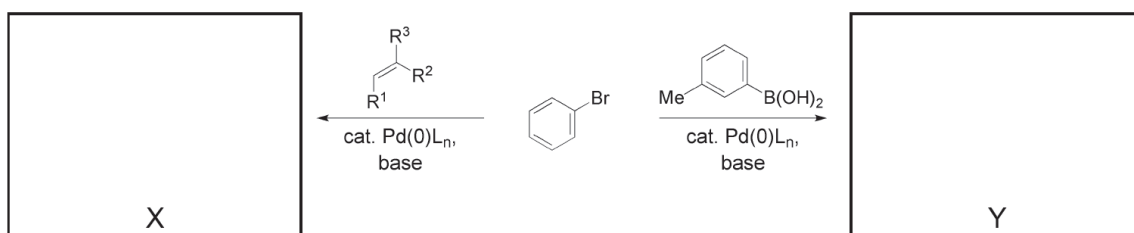
2. (5 points) Two different products (isomers) are formed by treating o-aminobenzofenone and methyl ethyl ketone under basic (KOH in water) and acidic (sulfuric acid in acetic acid) conditions. Explain.



3. (4 points) Give the missing products, starting materials, reagents or catalysts, and the scientist associated with the following reactions.

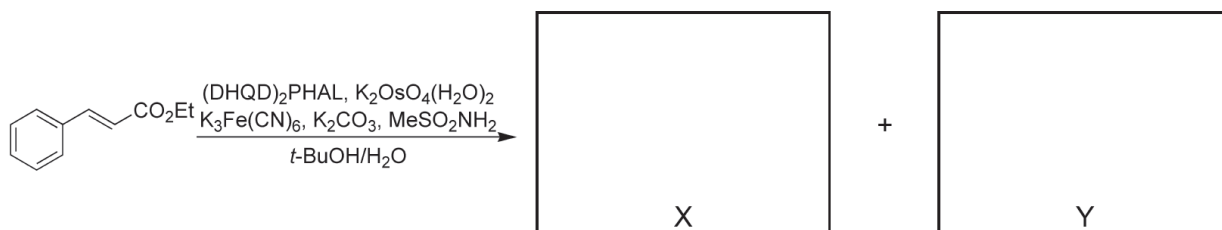


(a) name: _____



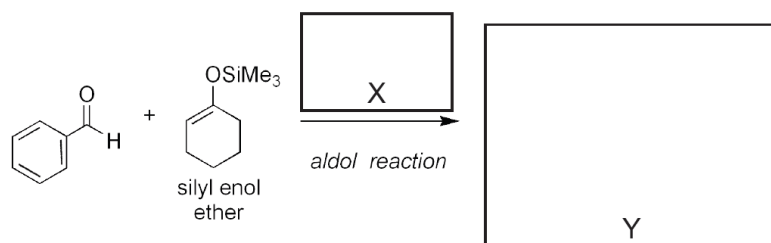
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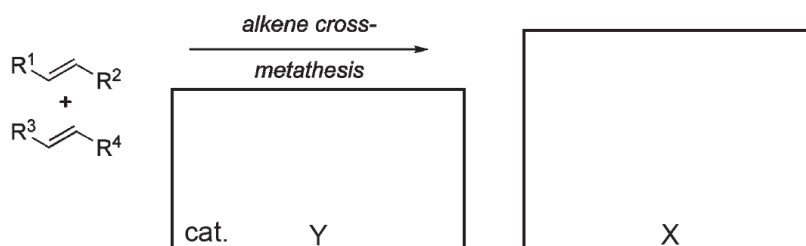


X:Y= 99:1

(d) name: _____

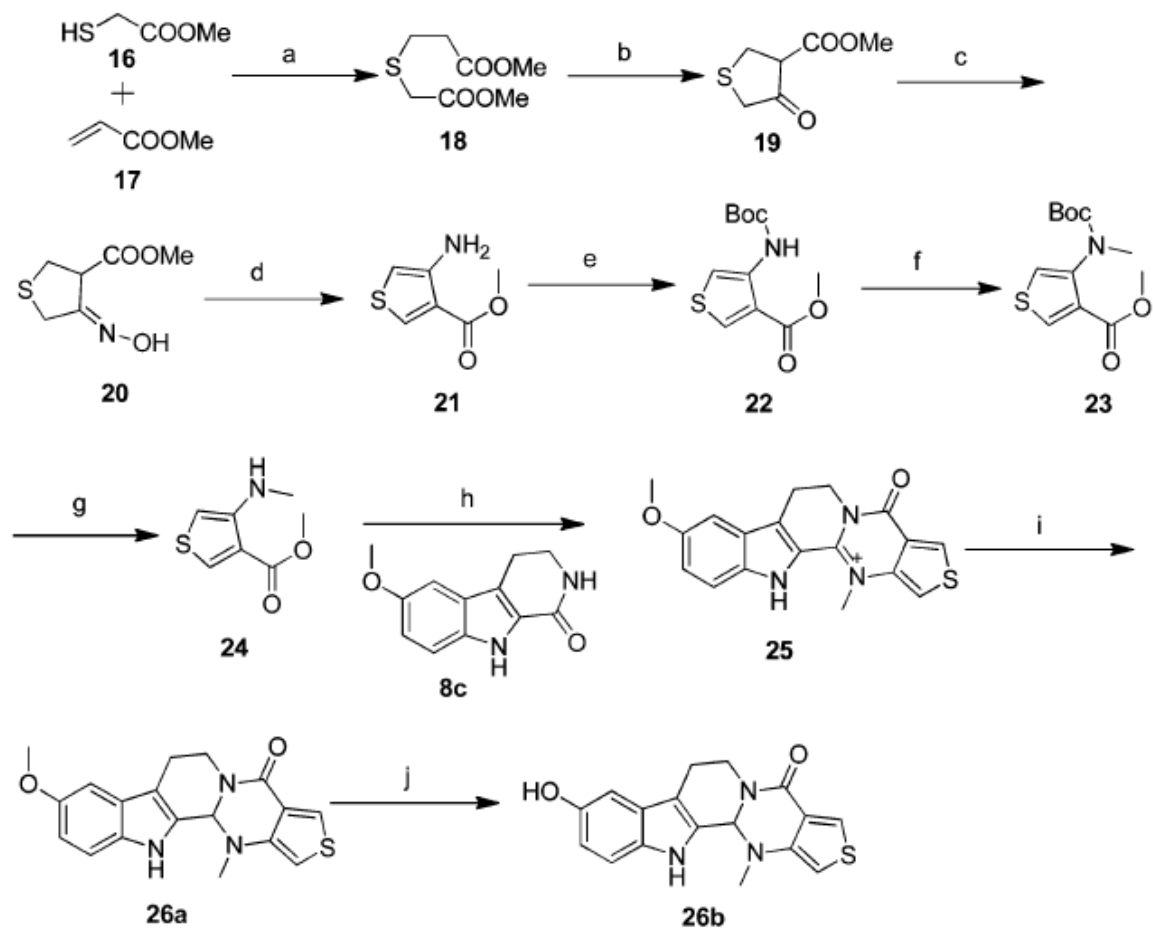


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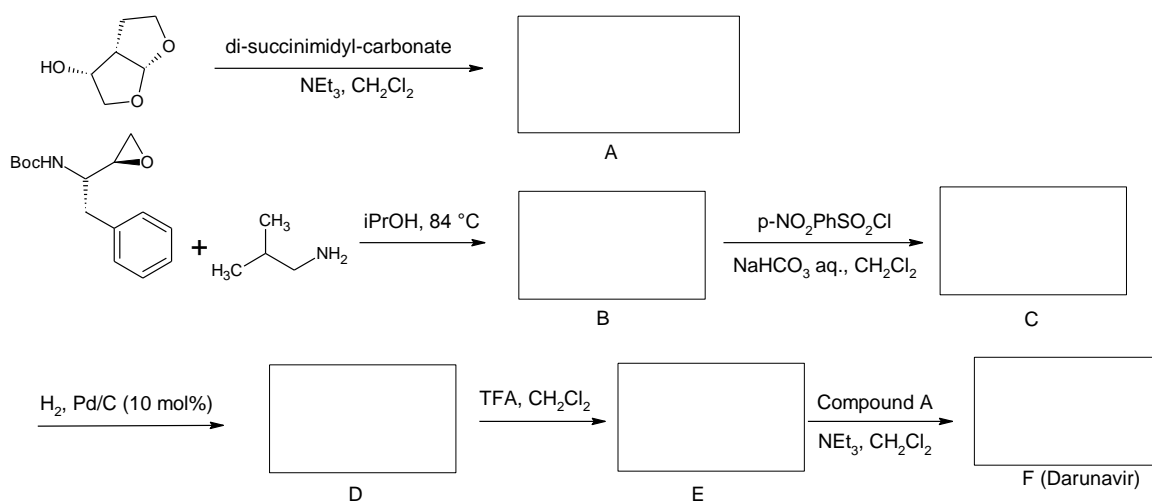


(f) name: _____

4. (5 points) Please fill in the missing reagents in the following reaction.



5. (5 points) Darunavir (brand name Prezista) is a protease inhibitor drug used to treat HIV infection. Write down the structural formulae of compounds A-F



6. (6 points) For the three compounds depicted below please provide:

- 1) Retrosynthetic disconnections
- 2) Forward synthesis (with reagents and conditions, NO MECHANISM!);

