

系別：化學學系

A

科目：有機化學

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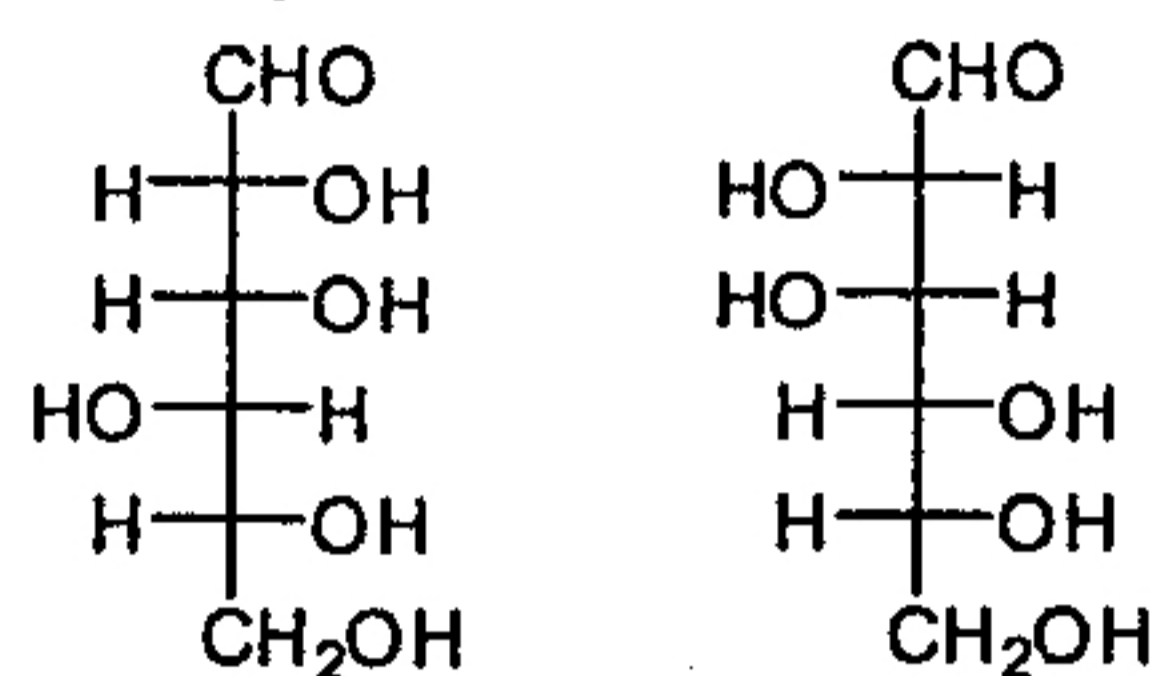
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I. Choose the most appropriate answers for the following questions (40%)

1. Optically active molecules which rotate plane-polarized light in a counterclockwise direction are said to be:

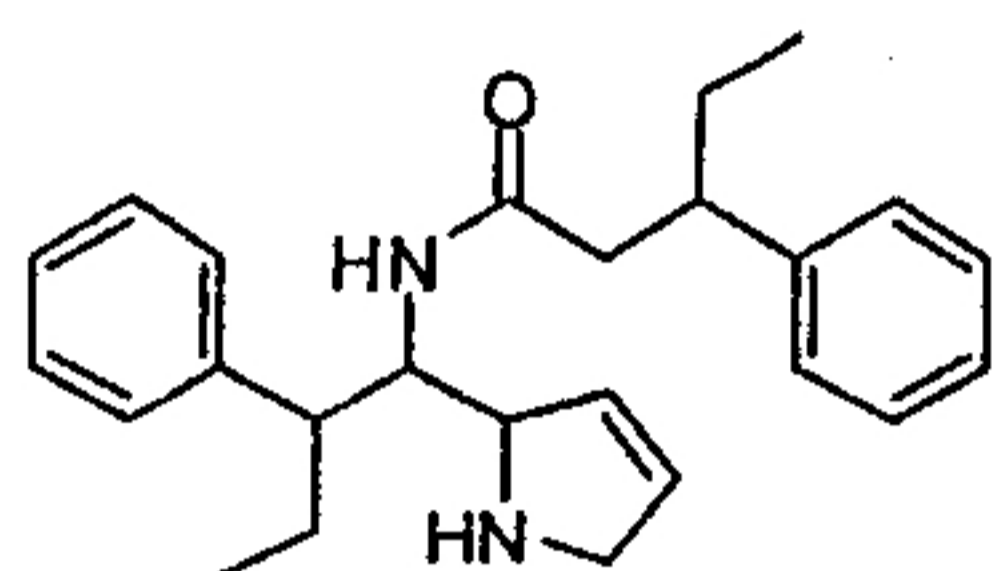
(A) levorotary (B) of R configuration (C) dextrorotary (D) of S configuration

2. Assign the correct term describing the relationship to the following two isomers:



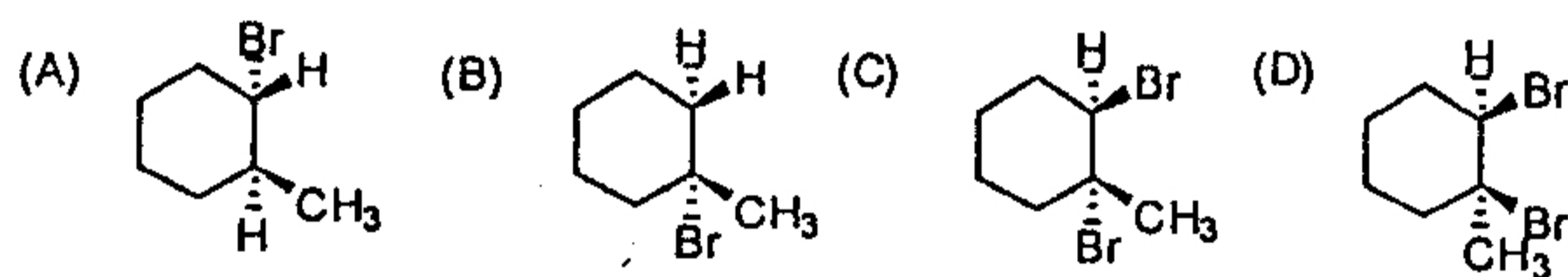
(A) enantiomers (B) diastereomers (C) identical.

3. How many stereoisomers of the following compound are possible in principle:

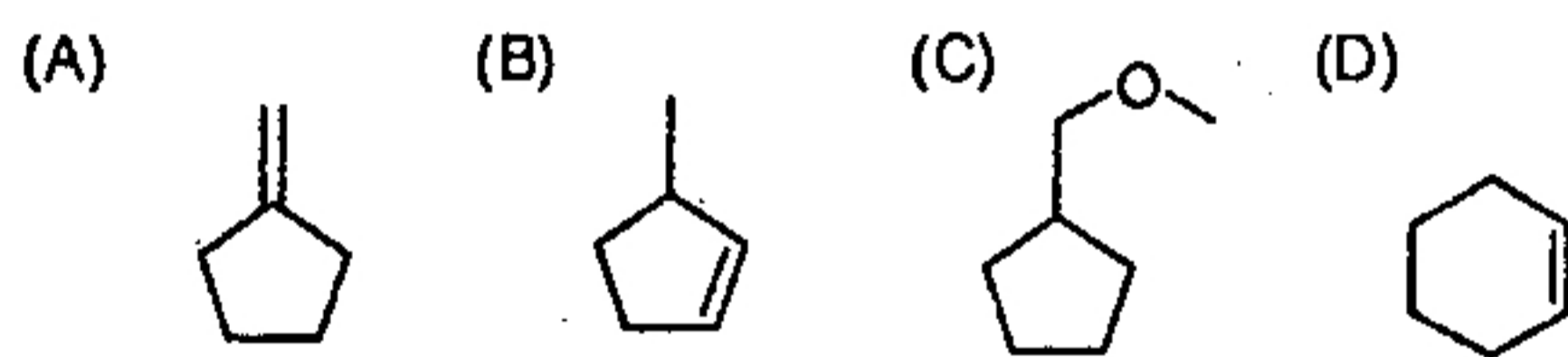
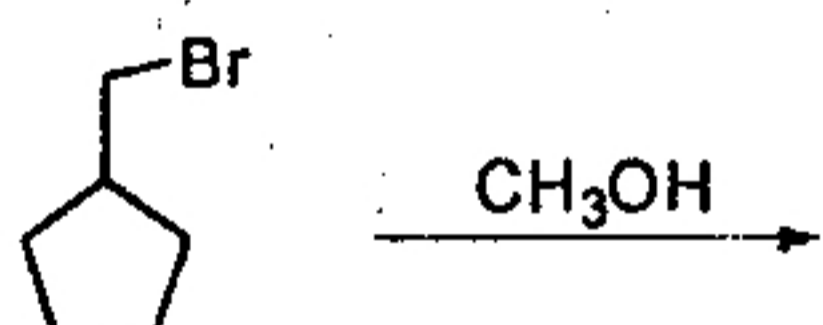


(A) 4 (B) 8 (C) 16 (D) 32

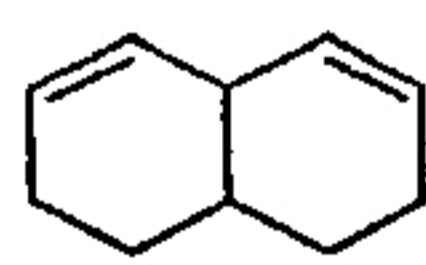
4. What is a product of the following reaction:



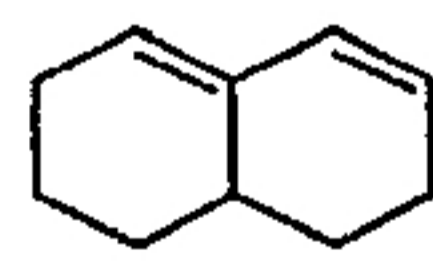
5. What compound could *not* be a product of the following reaction?



6. Indicate which spectral technique would best be used to distinguish between the following compounds:

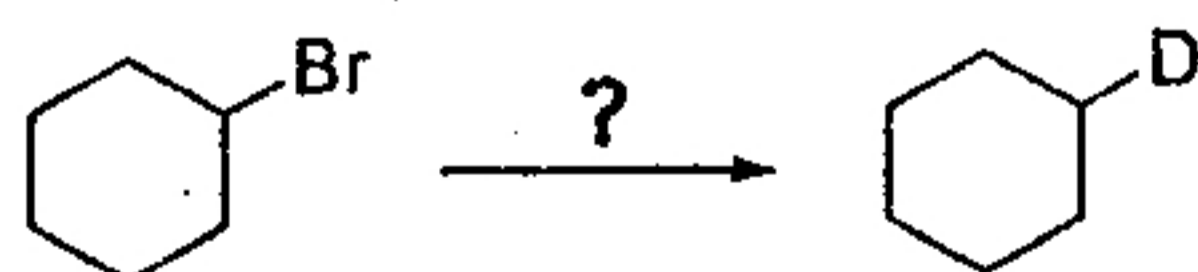


and



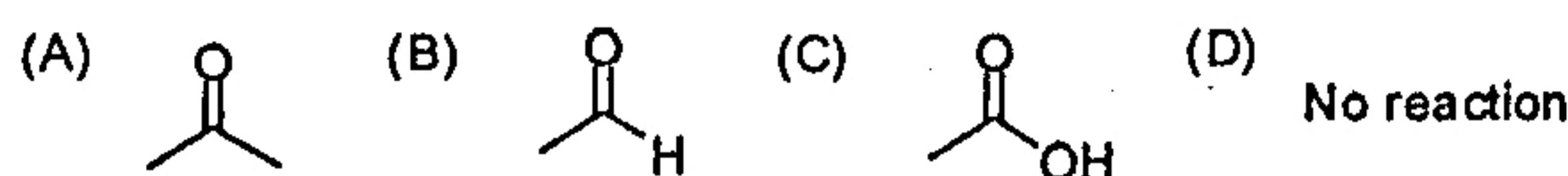
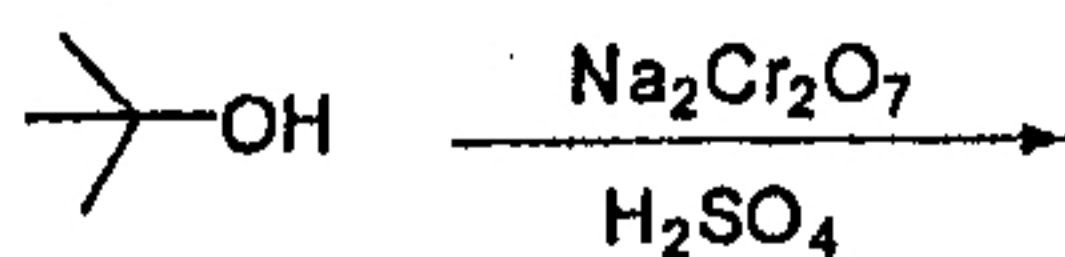
(A) ^1H NMR (B) IR Spectroscopy (C) Mass Spectrometry (D) UV Spectroscopy

7. Choose the best reagents to carry out the following reaction:



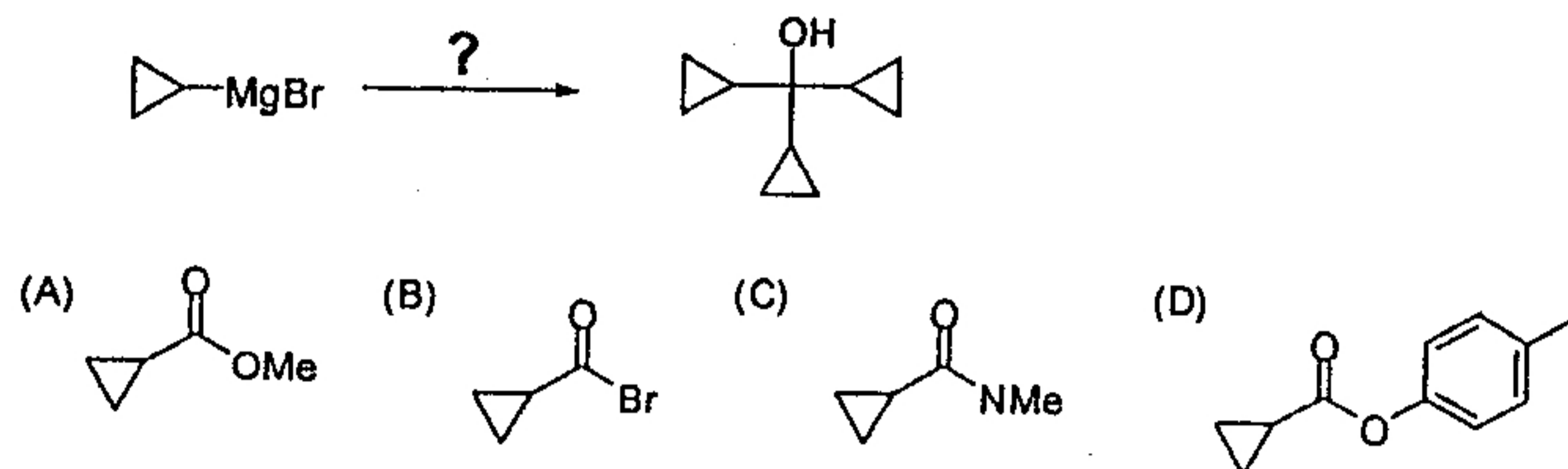
(A) D_2 , Pt (B) 1. Mg, ether; 2. D_2O ; (C) D_2SO_4 , D_2O , heat; (D) D_3O^+ , acetone, heat.

8. What is the major product of the following reaction:

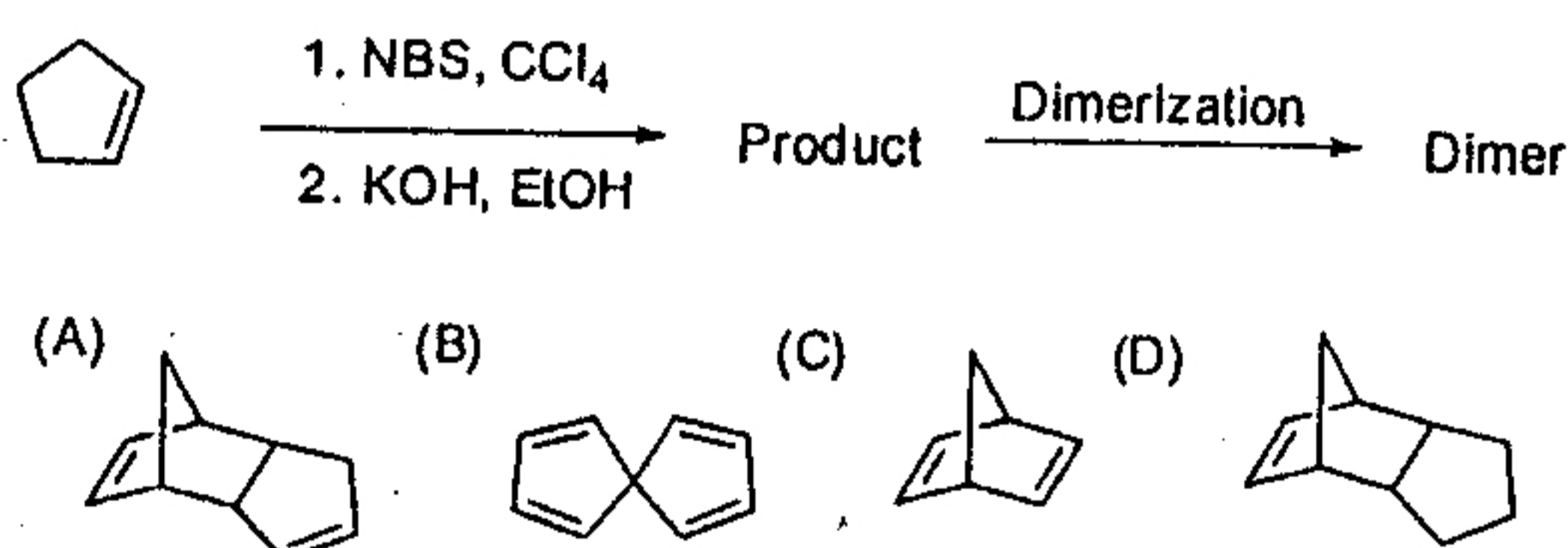


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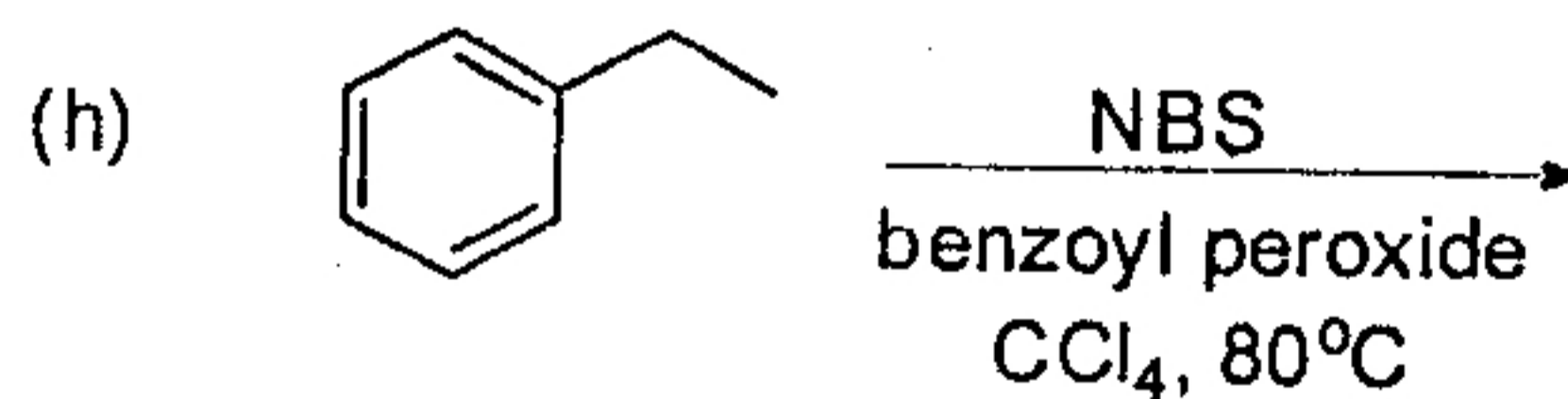
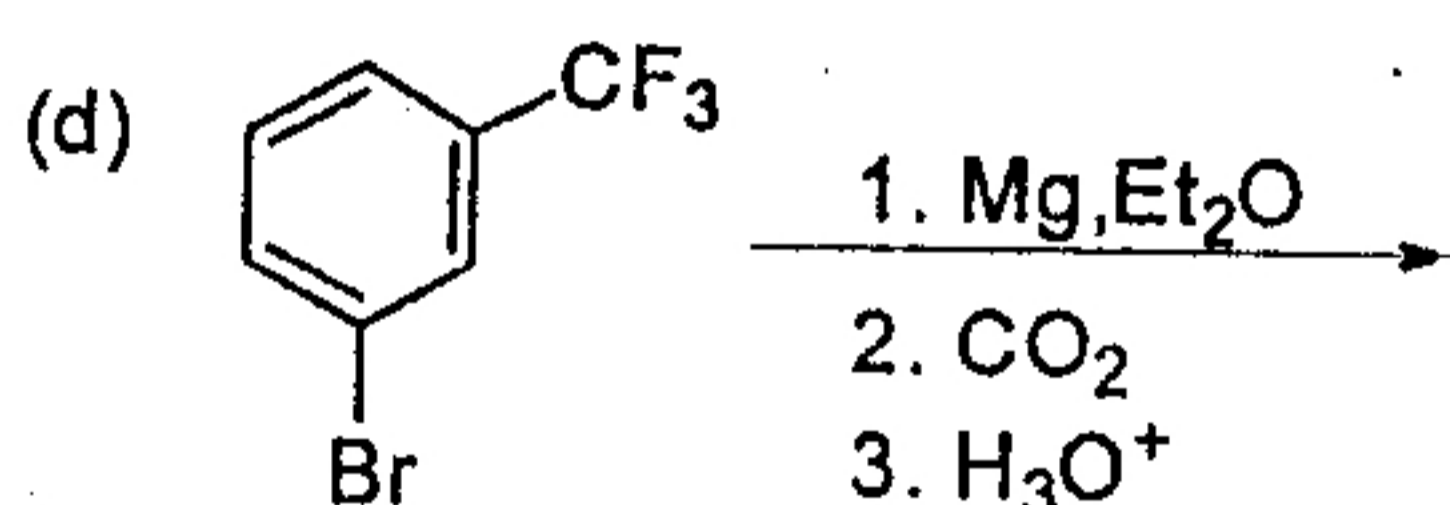
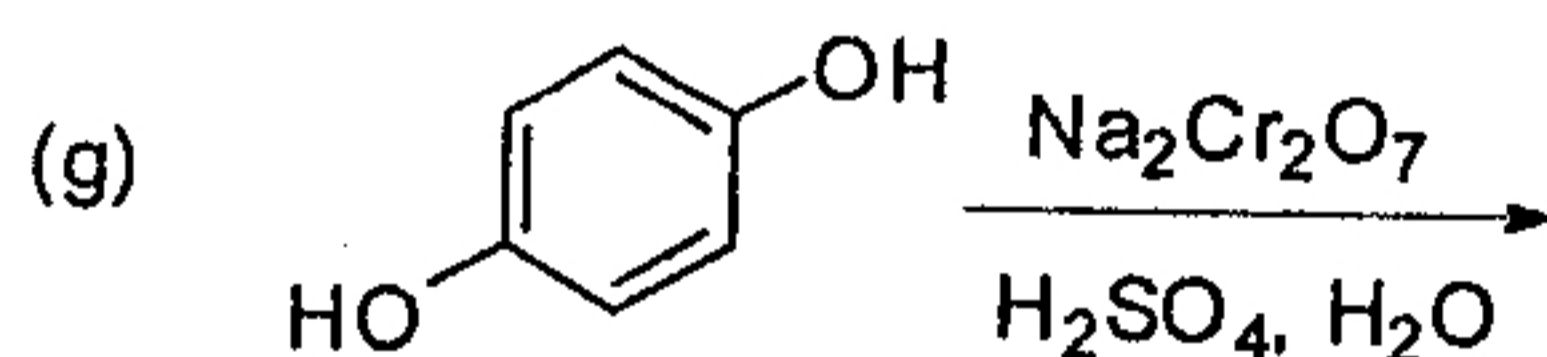
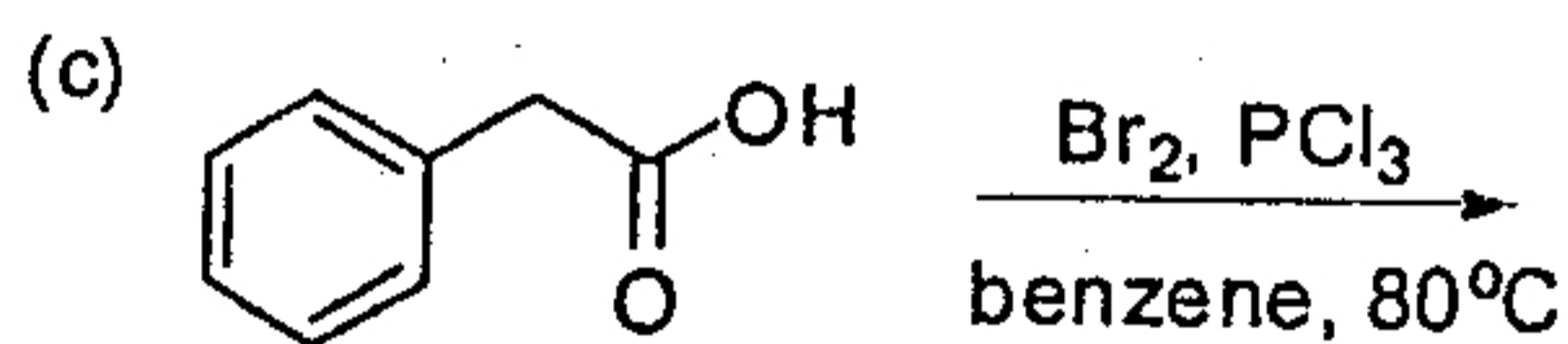
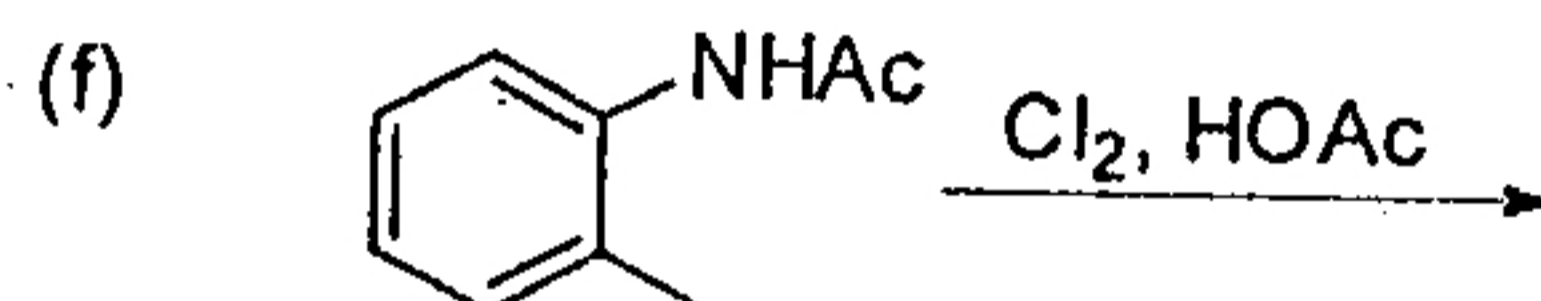
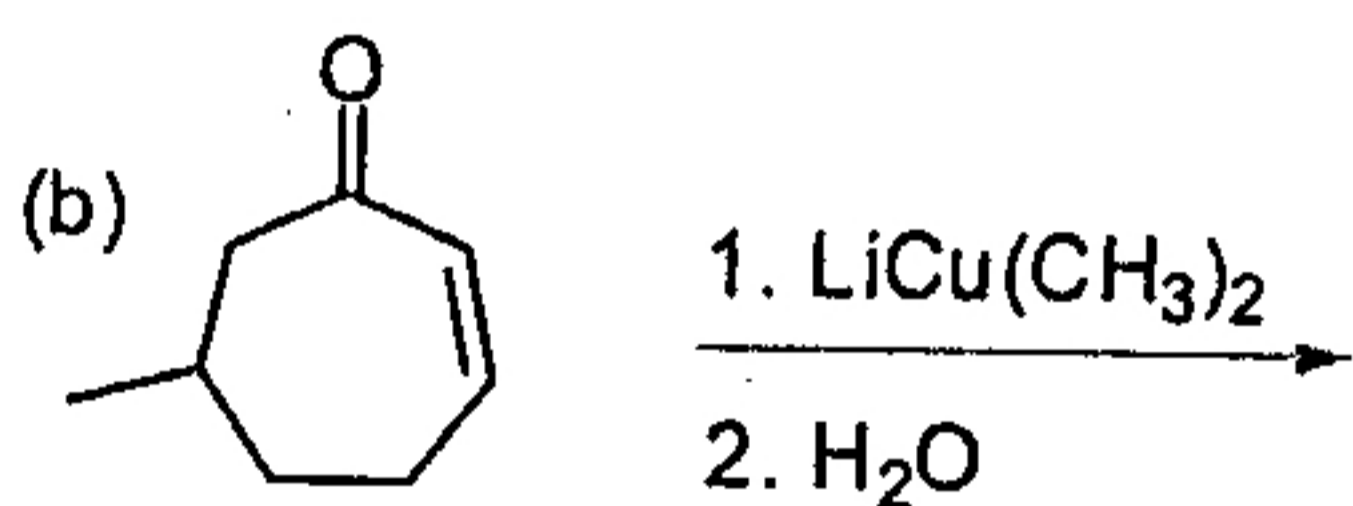
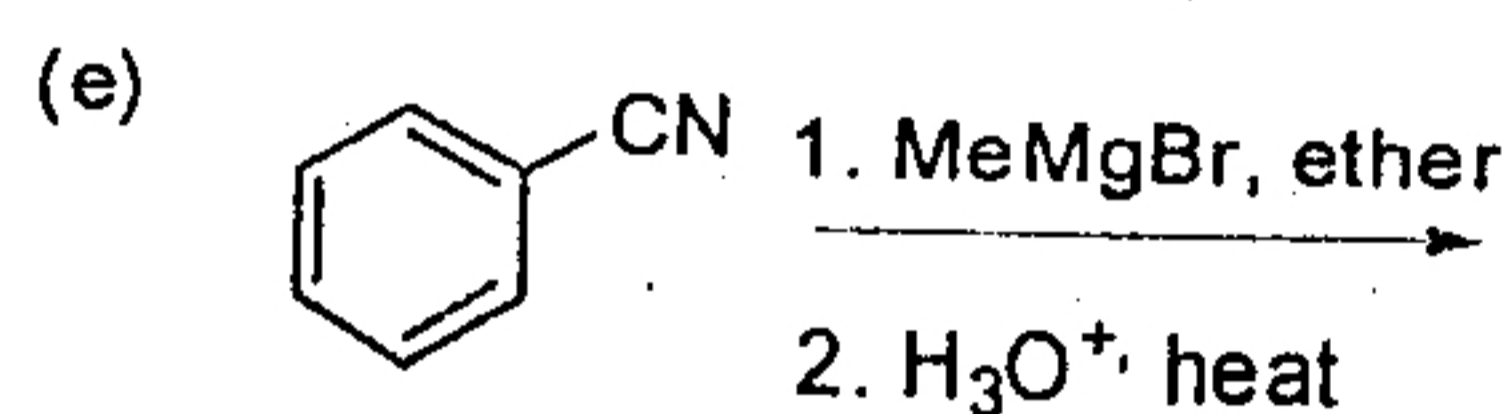
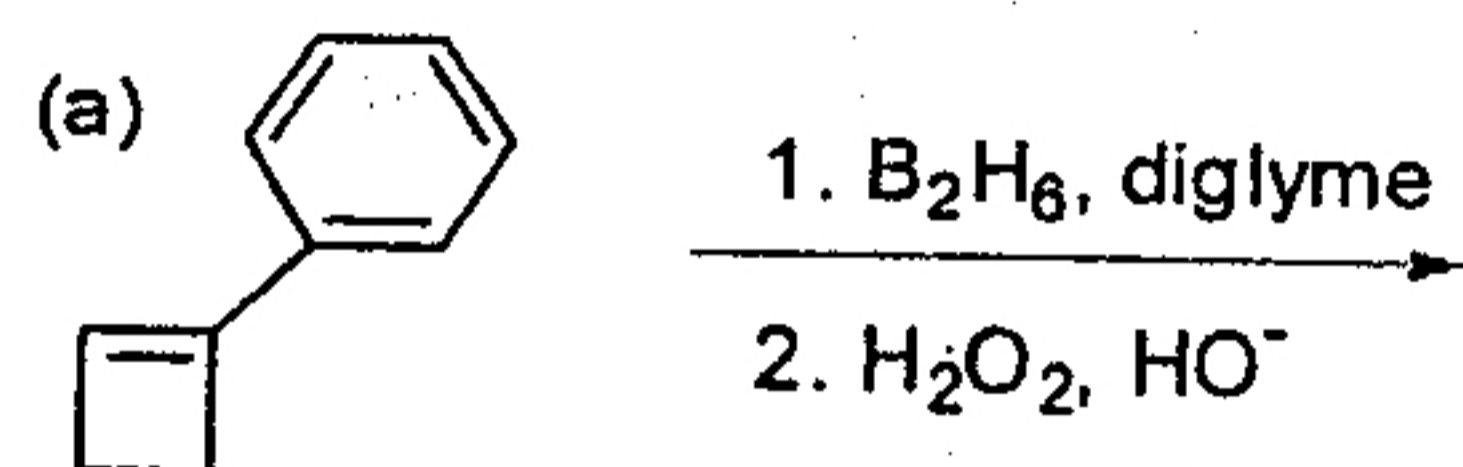
9. What reagent would undergo the following reaction the quickest?



10. The product of the following reaction immediately undergoes a dimerization at room temp (Diels-Alder reaction). To regain its normal monomer state, it must be heated. What is the structure of the dimer?



II. Give the structures of the major organic products for the following reactions. (40%)



III. Suggest the mechanism of the following reactions. (20%)

