

REVIEW QUESTION—HALO-COMPOUNDS –RX)

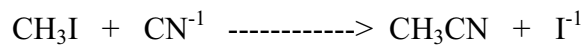
There are 4 isomers of  $C_4H_9Br$ .

- (a) Draw them.
- (b) Name them.
- (c) All 4 structural isomers react with  $NH_3$  in a similar way.
- Give the name of the mechanism involved in these reactions with an isomer of your choice.
  - Draw the structural formula of product formed and draw the mechanism of the reaction of this isomer with  $NH_3$
  - Select the isomer of molecular formula  $C_4H_9Br$  that would be the most reactive with  $NH_3$ . State the structural feature of your chosen isomer that makes it the most reactive of the isomers.
- (d) The elimination of  $HBr$  from one of the isomers produces 2 structural isomers, compound A and B
- Give the reagents and conditions required for this elimination reaction.
  - Give the structural formulae of the two isomers, A and B, formed by elimination of  $HBr$  from one of the isomers.
- (e) 1-Bromopropane can be converted into butanoic acid in a two stage process. Name suitable reagents for EACH stage of the conversion and calculate the percentage yield if 24.60 g of the halogen compound produces 8.80 g of the acid.
- (f) Under EACH of the following categories, name a compound of your own choice which is used, or has been used, on a large scale as:
- A pesticide.
  - An aerosol propellant.
  - A chlorinated solvent.

For each of the compounds chosen above, describe an adverse effect of its long term use or ready availability.

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(g) Iodomethane reacts with cyanide ions from sodium cyanide solution as follows:



The rate equation for this reaction is:

$$\text{Rate} = k [\text{CH}_3\text{I}] [\text{CN}^{-1}]$$

- i. Give the mechanism for the reaction and justify it on the basis of the rate equation.
  - ii. Give the reagents and conditions for a series of reactions by means of which iodomethane may be converted into methanoic acid.
- (h) Explain, if any, reaction would be observed when chlorobenzene reacts with cold aqueous NaOH.