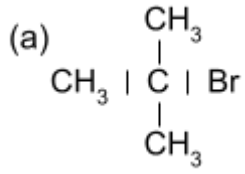
Nucleophilic Substitution Rxns Name: _____

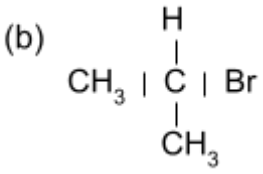
1. Name the following compounds.

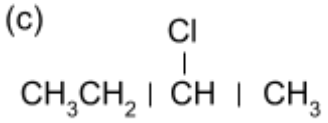
   (a) $CH_3CH_2CHClCH_3$ _____

   (b) $CH_3CHClCHClCH_3$ _____

2. Haloalkanes can be classified as primary, secondary or tertiary. Name and classify the following.







3. Explain, in terms of intermolecular forces, why the halogenoalkanes have higher boiling points than the alkanes but lower boiling points than the alcohols.

4. Halogenoalkanes undergo nucleophilic substitution reactions in which nucleophiles replace the halogen atom.

   (a) $OH^-_{(aq)}$ can act as a suitable nucleophile. Write the equation for its reaction with chloroethane.

   (b) **Amines** can be produced from halogenoalkanes by nucleophilic substitution reactions. Halogenoalkanes are reacted with ammonia dissolved in alcohol. Explain why the solvent used for the reaction must be **alcohol** and not water.

   (c) Write the equation for the formation of ethylamine from chloroethane.

5. Write equations for the following reactions.

(a) 2-chloro-2-methylpropane with aqueous KOH.

(b) 2-bromopropane with alcoholic KOH.

(c) 1-chloropropane with alcoholic NH_3.

(d) Chlorobutane with aqueous sodium hydroxide.

6. Amines with low molecular mass are soluble in water. Explain why they can dissolve in water.

7. The trend for boiling points in haloalkanes is iodoalkanes>bromoalkanes>chloroalkanes. Explain this trend.