Organic Reactions Practice

Write an equation for each of the following reactions. Use molecular and structural formulas and classify the reaction as combustion, addition, substitution, hydrogenation, or hydration.

(a) Octane burns with oxygen gas.

(b) 2-methyl-1-pentene reacts with hydrogen.

(c) Ethyne (Acetylene) and oxygen react.

(d) 3-methyl-1-butyne reacts with excess hydrogen.

(e) Chlorine reacts with ethane.

(f) Water and ethene are mixed in the presence of a catalyst at low pH.

(g) Bromine combines with benzene.

(h) Propene and HBr combine.

(i) Cyclohexene reacts with hydrogen gas.

(j) Acetylene reacts with excess hydrogen chloride.

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1. Propane reacts with fluorine.

2. Chloroethane reacts with dilute sodium hydroxide.

3. Ethanol, present in gasohol, burns in an automobile engine.

4. In an elimination reaction 1-butanol reacts in the presence of concentrated sulfuric acid.

6. Bromine and ethene react to form an alkyl halide.

7. Hydrogen chloride and propene react to produce an alkyl halide.

Write an equation using structural diagrams to show the production of each of the following alcohols from an appropriate alkene:

(a) 2-butanol
(b) 2-methyl-2-propanol

Draw structural diagrams and write IUPAC names to illustrate the controlled oxidation of the following alcohols. Is the product an aldehyde or a ketone?

(a) 2-pentanol
(b) 1-hexanol

Name the following esters, and the acids and alcohols from which they could be prepared.

(a) $CH_3CH_2COOCH_2CH_3$
(b) $CH_3CH_2CH_2COOCH_3$

For each, write a structural formula and an equation or a series of equations for a method of synthesis from the suggested reactants.

synthesis of a carboxylic acid from the controlled oxidation of 1-propanol

N-methyl ethanamide from methane, ethanol, and inorganic compounds of your choice.

2-pentyl butanoate from pentene and butanal

Butyl 2-methylpropanoate from 1-butanol and an appropriate alcohol

4-heptanone from an alcohol

ethyl ethanoate from ethane

pentyl ethanoate from ethene and an alcohol

3-octanone from a simpler compound

methyl hexanoate from two alcohols

sodium salt of butanoic acid from ethyl butonoate

trimethylamine from ammonia and alkanes

N-ethylethanamide from an alkane and ammonia