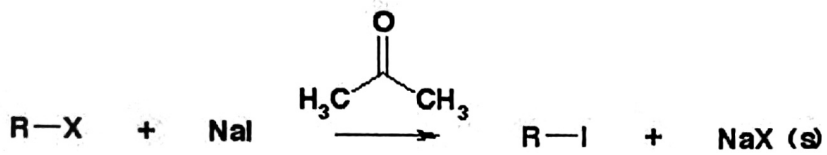
Name: Max Shi Date: 8/12/19

Exp 7- SN^2 reaction
Synthesis of *alkyl iodide from alkyl halide.*

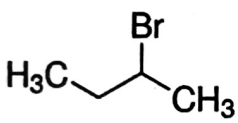
Halides can react with sodium iodide in acetone and undergo SN^2 reaction which is evident by formation of precipitate of NaX (see below).
If the reaction proceed then you will see a precipitate. If the reaction doesn't go then you will not see a precipitate.



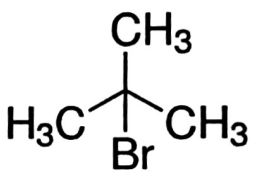
Answer questions 1-6:

(1) Which alkyl bromide will react fastest with sodium iodide in acetone:
1-bromobutane, 2-bromobutane or 2-bromo-2-methylpropane?

1-bromobutane



2-bromobutane



2-bromo-2-methylpropane

(2) Which alkyl bromide will react slowest?
2-bromo-2-methylpropane

(3) Explain how the structure of the alkyl halide affects the rate of an SN^2 reaction
the more substituted the alpha carbon is, the more steric hindrance there is for the backside attack, which makes SN^2 slower.

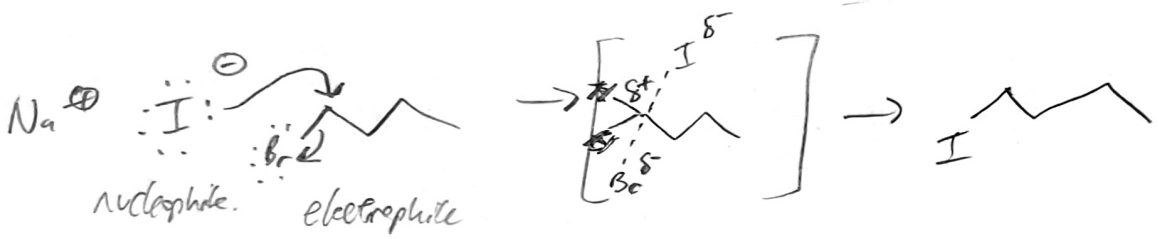
(4) Which halide will faster with sodium iodide in acetone:
1-bromobutane or 1-chlorobutane?

1-bromobutane will react faster

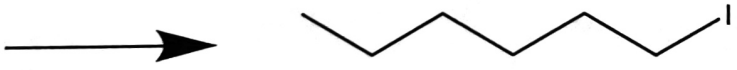
(5) Explain how the nature of the leaving group affects the rate of an SN^2 reaction. Would 1-iodobutane react faster or slower than the other halides?

The leaving group better a better leaving group will have a faster reaction rate in S_N2. Br is less electronegative and larger than Cl, making it a better leaving group. Thus, 1-iodobutane would be faster.

(6) (a) Write balanced equations for substitution reaction and Propose transition states for the reaction of sodium iodide with 1-bromobutane
(b) Label electrophile and nucleophile.



(7) Perform a Scifinder search to find out number reactions reported for the the preparation of 1-iodohexane: Paste the screen shot of the results.



1-iodohexane

~~1970~~ reactions.

~~93~~

(Signed by TA or Instructor):

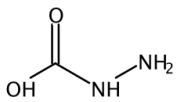
1. View Reaction Detail | Link | Similar Reactions

Single Step *Hover over any structure for more options.*

Overview

Steps/Stages

1.1 R:



R:I_2, 24 h, 100°C

Notes

no solvent, optimization study, optimized on stoichiometry of reagents and time, pressure reactor used, Reactants: 1, Reagents: 2, Steps: 1, Stages: 1, Most stages in any one step: 1

References

Preparation of alkyl halide

Quick View PATENTPAK

By Hur, Nam Hwi et al

From PCT Int. Appl., 2017155356, 14 Sep 2017

2. View Reaction Detail | Link | Similar Reactions

Single Step *Hover over any structure for more options.*

Overview

Steps/Stages

Notes