Reactivities of Alkyl Halides Procedure Notes

Alkyl Halides Examined

1.) 2-chlorobutane     5.) 2-chloro-2-methylpropane
2.) 2-bromobutane      6.) bromobenzene
3.) 1-chlorobutane      7.) bromocyclohexane
4.) 1-bromobutane       8.) bromocyclopentane

Conditions Examined

Reaction with NaI in acetone at room temperature and with heat

Reaction with AgNO₃ in ethanol at room temperature and with heat

Construct an 8 x 4 cell table. Make sure that you leave enough room in each cell for observations. During the course of the reactions, you will be noting the time at which a reaction occurs (i.e. precipitate forms - the solution appears cloudy), and if you had to heat it to get a reaction to occur. From this info, you will evaluate your results.

We will be omitting crotyl chloride and benzyl chloride from the testing. We will also double the concentration of the reacting halides by using half the solvent volume stated in the lab text. This will give more accurate results overall for both parts of the experiment.

Procedure

Sn₂ Reactivity - NaI in Acetone

Place 1 mL of NaI in acetone in each of 8 labeled test tubes.

Add 4 drops of the appropriate halide. Mix thoroughly.

Record the time of mixing. Watch for cloudiness or ppt, while you continue to add the next halide.

Record the time of reaction for each halide.

For those that don’t react, place the tubes in a hot water (50 degree) bath, heat for 1 minute, look for cloudiness or ppt, and note any reactions.

Sn₁ Reactivity - Ethanolic AgNO₃

Place 1 mL of 1% AgNO₃ in each of 8 labeled test tubes

Add 4 drops of halide, mix, record the time of mixing. Watch for cloudiness or ppt, while you continue to add the next halide.

Record the time of reaction for each halide.

Place the tubes for those that don’t react in a hot water (100 degree) bath, heat for 1 minute, look for cloudiness or ppt, and note any reactions.