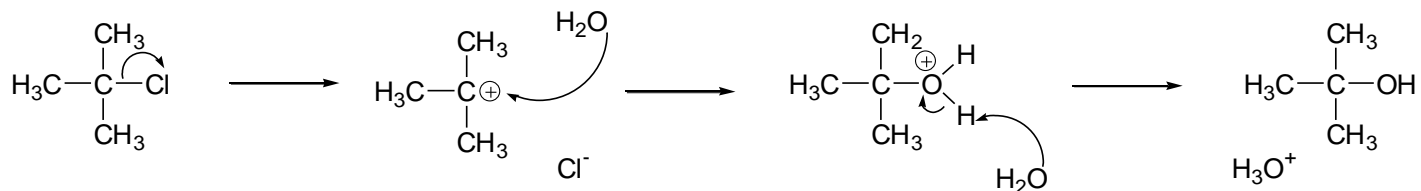
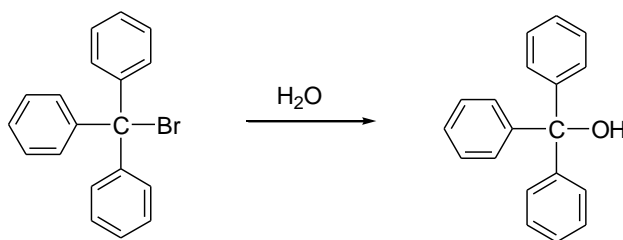


## S<sub>N</sub>1 Substitution of Triphenylmethyl Bromide

Substitution of tertiary alkyl halides occurs through the S<sub>N</sub>1 mechanism. S<sub>N</sub>1 is a two step reaction with first order kinetics. In the first step of the S<sub>N</sub>1 reaction the leaving group leaves producing a carbocation intermediate. In the second step a nucleophile adds to the carbocation. If a neutral nucleophile is used, the reaction has an additional step where the product loses a proton to become neutral.



In this lab you will synthesize triphenylmethanol from triphenylmethyl bromide. Water will be used as the nucleophile. Suggest a mechanism for this transformation in your notebook.



### Procedure

**Reaction:** Place 0.50g of triphenylmethyl bromide in a 100mL round bottom flask with a magnetic stirrer. Add 10mL of acetone and stir until dissolved. Next add 20 mL of water and stir for 10 minutes. Cover the bottom of a 250mL beaker with ice and pour the reaction mixture over the ice, including the stirbar. Continue to stir in the beaker until the ice has melted.

**Isolation and Purification:** Vacuum filter the solid in the beaker. Rinse the solid with 5 mL of cold water and allow it to dry on the vacuum line for 5 minutes.

Recrystallize your product from isopropanol. Transfer your solid to a 100mL beaker. In another beaker, heat 10 mL of isopropanol on a hot plate until boiling. Place the beaker with product on the hotplate and add hot isopropanol in small portions to it. Swirl after each addition. When the solid completely dissolves, stop adding solvent, allow the beaker to cool to room temperature, then cool further in an ice bath. Vacuum filter the resulting solid, place in an envelope and allow it to dry until the next laboratory period.

**Characterization:** Record the mass of the dry product and calculate percent yield. Record the melting point of the product.

**Chemicals:** Triphenylmethyl bromide, acetone, isopropanol

**Waste:** Put your product in the solid waste jar. Filtrates should go in the marked organic waste bottle.