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**Nucleophilic Addition: The Grignard Reagent**

 This experiment was designed in order to synthesize a Grignard reagent, and react it with a ketone to generate a tertiary alcohol. The theoretical yield for the experiment was 3.28g of triphenylmethanol. There was actually 0.53 g of triphenylmethanol at the end of the experiment, with the percent yield resulting to be 16.2%. The melting point obtained from the product was 150°C.

$$Bromobenzene \left(\frac{157.01g}{mol}\right)+Magnesium \left(\frac{24.305g}{mol}\right) \rightarrow Triphenylmethanol \left(\frac{260.33g}{mol}\right)$$

$$\left(0.992g x \frac{1mol}{157.01g}\right)\left(bromobenzene\right)+\left(0.1527g x\frac{1mol}{24.305g}\right)\left(Mg\right)=0.012601 mol$$

$$0.12601mol x\frac{260.33g}{1mol}=3.28g (triphenylmethanol)$$

$$\frac{Actual Yeild}{Theoretical Yeild} = \frac{0.53g}{3.28g}= 0.1615 = 16.2\%$$

In the IR spectra for the reactant bromobenzene, there is a short jagged peak at 3027 cm-1 for the phenol ring, with a relative intensity of 84%. At 1476 cm-1 there is also a C=C peak, with a relative intensity of 4%. In the IR spectra for the reactant Benzophenone there is also a short, jagged peak for the phenol group, it has a cm-1 of 3031 and the relative intensity is 79%. There is a C=O peak at 1665 cm-1 with a relative intensity of 4%. The position of the C=O peak suggests that there is a ketone that is next to a double bond, due to the peak being near 1690 cm-1. In the product there are reactant peaks that are still present such as the phenyl peak, which shifted slightly to the right, next to the O-H peak. The O-H peak, however, is new to the product at 3474 cm-1. The C=O from the Benzophenone is not present in the product IR spectra.