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Product Yield Determination via an Integrated ^{13}C Spectra

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Product Yield Determination via an Inverse Gated ^{13}C Spectra

Riley Zimmer

The goal of this research is to further develop an experiment that will allow organic chemistry students to compare the ring-opening reaction behavior of an epoxide under acidic and basic conditions. Propylene oxide was used as the epoxide and the composition of each product mixture was determined using Nuclear Magnetic Resonance (NMR) via an Inverse Gated ^{13}C (IG ^{13}C) spectra. Napthalene was used as an internal standard. Propylene oxide was refluxed under acidic conditions to produce a 50:50 ratio between 2 products at a 68% yield. Under basic conditions, a 67% yield was produced with a 99:1 ratio between the products. These results were significantly lower than previous work. The experimental procedure of this experiment will continue to be manipulated with hopes of producing a higher, more consistent product yield.

Key Words:

NMR

IG ^{13}C NMR

Propylene Oxide

Napthalene

Product Yield

Acid/Base