Robert Robinson's Contributions to Organic Chemistry

Ben Albrecht
Parkland College

Recommended Citation
https://spark.parkland.edu/nsps/143

Open access to this Poster is brought to you by Parkland College's institutional repository, SPARK: Scholarship at Parkland. For more information, please contact spark@parkland.edu.
Robert Robinson’s Contributions to Organic Chemistry

By Ben Albrecht
Parkland College

Steroid and Alkaloid Research

A major focus of Robert Robinson’s organic chemistry research was the synthesis of alkaloids and steroids.
- Alkaloid: a heterocyclic organic compound that contains nitrogen and it is found in plants.
- Physiological functions from alkaloids include medicine, poison, stimulants, tranquilizers, and more (2).
- Steroids: compounds that consist of three six-membered rings and one five-membered ring. Robinson created two strategies of synthesizing the ring systems (3).
  - Strategy 1: construct the four rings together early in the reaction and to make modifications afterwards
  - Strategy 2: construct tricyclic structures with correct components that would lead to formation of a fourth ring (3)

In 1922, Robert Robinson was the first person to ever use curly arrows in his publication called “An Exploration of the Property of Induced Polarility of Atoms and an Interpretation of the Theory of Partial Valencies on an Electronic Basis.” Curly arrows are used to show movement of electrons in reaction mechanisms. (3)

Tropinone Synthesis

Willstätter’s 1901 Tropinone Synthesis
- Way too tedious and expensive
- Only 1% yield (4)

Robinson’s 1917 Tropinone Synthesis
- Single-step transformation
- Succinyl aldehyde, methylamine hydrochloride, and acetylene dicarboxylic acid were combined
- 42% yield (4)
- Developed by Retrosynthesis, a technique that allows one to plan a reaction by starting with a given product and working backwards to find precursors (5)

Bibliography