Implementation and Innovation in Total Synthesis

Goodwin, William (2008) Implementation and Innovation in Total Synthesis.

Abstract

This paper investigates how understanding the theory of organic chemistry facilitates the total synthesis of organic compounds. After locating the philosophical significance of this question within the methodology or epistemology of applied science, I summarize the results of previous work on this issue – roughly that theoretical organic chemistry underwrites a sequence of heuristic policies that help to isolate plausible synthetic routes from the array of possibilities provided by structural or descriptive organic chemistry. While this previous work makes a solid start, it does not capture all of the ways that the theory of organic chemistry contributes to total synthesis. This paper aspires to enrich this previous work by exploring some additional ways that theory contributes. More specifically, I investigate how understanding the theory of organic chemistry can facilitate both the development of novel synthetic reactions and the implementation of a synthetic plan. The role of theory in these aspects of total synthesis will be explored by considering a particular, novel synthesis of longifolene.

Keywords:	organic chemistry, total synthesis, Philosophy of applied science, Philosophy of technology, longifolene
Subjects:	General Issues: Technology Specific Sciences: Chemistry
ID Code:	3899
Deposited By:	Goodwin, William Mark
Deposited On:	18 Febuary 2008