

Chemical Reviews

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Strained Organic Compounds: Introduction

The concept of strain has fascinated organic chemists for about a century, and the interest shows no sign of abatement; if anything, it is growing. Over this period of time, our attitudes have changed dramatically. Today, we accept the remarkable stability of [1.1.1]propellane and tetra-*tert*-butyltetrahedrane casually. Two decades ago, a student who would draw such "impossible" structures during an examination would have surely failed. We wonder what other marvels lie in store.

The present issue, dedicated to strained organic compounds, contains 17 contributions from leading authorities. Most of the reviews deal with compounds containing strained hydrocarbon skeletons. Seven of these cover compounds in which the strain is due to the presence of small saturated rings: small-ring propellanes are treated by Wiberg, tricyclo[2.1.0.0^{2,5}]pentanes by Dowd and Irngartner, cubanes by Griffin and Marchand, homocubanes and polyhomocubanes by Marchand, a variety of cage bridgehead alcohols by Klunder and Zwanenburg, and a series of C₈H₈ hydrocarbons by Hassenrück, Martin, and Walsh. Although not strained in the same way, dodecahedranes round off the series and are discussed by Paquette.

Another five reviews deal with systems in which the strain is related to the simultaneous presence of small rings and unsaturation. Strained bridgehead double bonds are treated by Warner, doubly pyramidalized alkenes by Borden, strained cyclic cumulenes by Johnson, bicyclo[*n*.1.0]alkenes by Billups, Haley, and Lee, and cyclopropenes by Halton.

Two articles deal with small-ring heterocycles: dioxiranes are reviewed by Murray and 3-heteroquadricyclanes by Tochtermann and Olsson. The latter article emphasizes synthesis; the survey of optically active cyclopropanes by Salaün is dedicated to synthetic aspects nearly exclusively.

Another contribution, by Liebman and Greenberg, is devoted to thermochemistry of three-membered ring systems.

Finally, Alder's review on the strain effects on amine basicities is unique in that it deals with several classes of compounds in which strain arises from sources other than small rings.

It is hoped that this collection of articles, which represents an incredible number of hours of diligent work by leading experts, will warm the heart of many an organic chemist, and perhaps even of some curious souls with only a casual interest in organic chemistry.

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