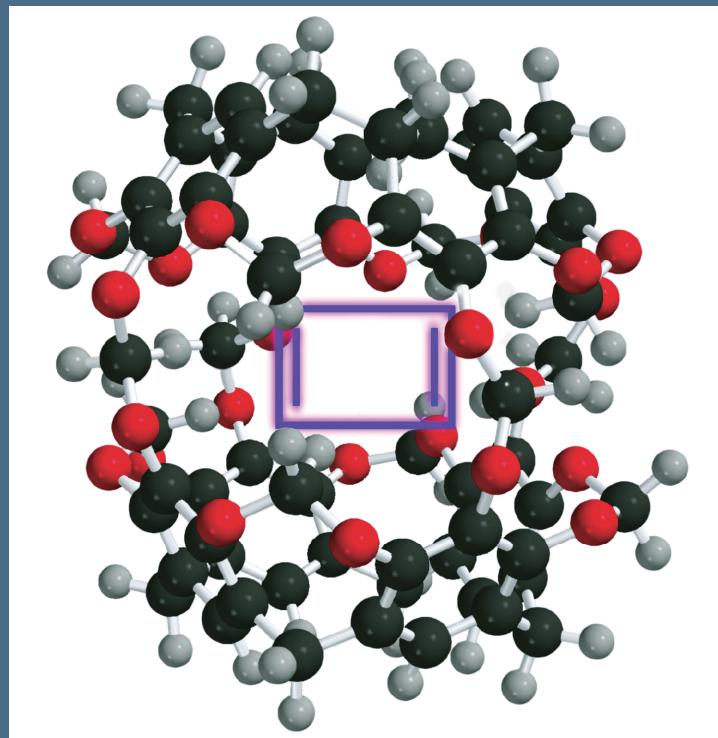


STUDENT SOLUTIONS MANUAL

to accompany

Modern Physical Organic Chemistry

Eric V. Anslyn / Dennis A. Dougherty



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S T U D E N T S O L U T I O N S M A N U A L
T O A C C O M P A N Y

Anslyn & Dougherty's
**Modern Physical
Organic Chemistry**

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About the Cover -- Taming Cyclobutadiene: An object of physical organic investigations for decades, cyclobutadiene was finally "tamed" in 1991, when Cram and coworkers generated the molecule in the cavity of a hemicarcerand. This supramolecular complex allowed full characterization of cyclobutadiene, including recording its NMR spectrum at room temperature. See Section 4.3.3.

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To the Student

This *Solutions Manual* provides solutions (not just answers) to all end-of-chapter exercises in *Modern Physical Organic Chemistry*: nearly 600 solutions, not including multiple parts. Used properly – to compare with your own solutions – this manual will contribute tremendously to your understanding of the concepts and methods presented in the textbook. Used improperly – before you have tried the exercise on your own – its value will be marginal.

Learning physical organic chemistry, like other areas of chemistry, requires much more of you than memorization of facts. You will be expected to learn principles and ways of thinking and to apply them in various contexts to show that you can make sense of an observed product, rate constant, or pK_a value. You will also be expected to use your knowledge to make predictions and design experiments to test your predictions. Such skills cannot be learned by reading someone else's answer. You might recognize that it makes sense, and you might pick up another fact or two, but you will not have gained the valuable experience of working through the issues on your own!

Like the textbook, this *Solutions Manual* has "GOING DEEPER" highlights on selected issues – 22 in total. These are provided to explore intriguing issues that go beyond the question that is posed in the exercise. We encourage you to develop the habit of "going deeper" when you come across an interesting question that is not so simply answered or a question that leads to more questions. Physical organic chemistry is full of such opportunities to be inquisitive!

Acknowledgment

The authors would like to thank University Science Books for supporting this solutions manual which we believe enhances the value of the associated text.

M. B. S.
E. V. A
D. A. D.



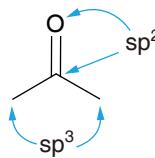
C H A P T E R

1

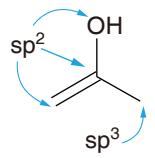
Introduction to Structure and Models of Bonding

S O L U T I O N S T O E X E R C I S E S

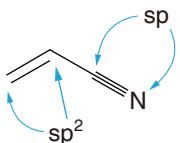
1.A.



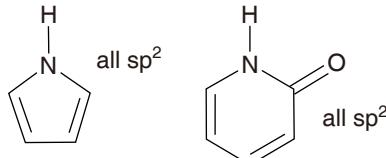
B.



C.



D.



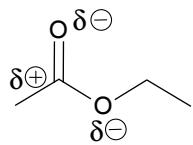
Note that the O in part B is better thought of as sp^2 rather than sp^3 , so that the lone pair in the p orbital may best participate in resonance with the double bond.

2. Formal charges exist in A (+ on N)

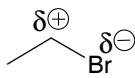
D (+ on O), and
E (- on S).

Bond polarizations:

B.

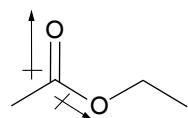


C.



3.

B.



C.

