

PEARSON NEW INTERNATIONAL EDITION

Study Guide and Student's Solutions
Manual for Organic Chemistry
Paula Y. Bruice
Seventh Edition



Pearson New International Edition

Study Guide and Student's Solutions
Manual for Organic Chemistry
Paula Y. Bruice
Seventh Edition

Pearson Education Limited

Edinburgh Gate

Harlow

Essex CM20 2JE

England and Associated Companies throughout the world

Visit us on the World Wide Web at: www.pearsoned.co.uk

© Pearson Education Limited 2014

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without either the prior written permission of the publisher or a licence permitting restricted copying in the United Kingdom issued by the Copyright Licensing Agency Ltd, Saffron House, 6–10 Kirby Street, London EC1N 8TS.

All trademarks used herein are the property of their respective owners. The use of any trademark in this text does not vest in the author or publisher any trademark ownership rights in such trademarks, nor does the use of such trademarks imply any affiliation with or endorsement of this book by such owners.

PEARSON®

ISBN 10: 1-292-04157-9

ISBN 13: 978-1-292-04157-5

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library

Printed in the United States of America

Table of Contents

1. Spectroscopy Problems Paula Y. Bruice	1
2. Remembering General Chemistry: Electronic Structure and Bonding Paula Y. Bruice	55
3. Acids and Bases: Central to Understanding Organic Chemistry Paula Y. Bruice	77
4. SPECIAL TOPIC I: pH, pKa, and Buffers Paula Y. Bruice	95
5. An Introduction to Organic Compounds: Nomenclature, Physical Properties, and Representation of Structure Paula Y. Bruice	115
6. Isomers: The Arrangement of Atoms in Space Paula Y. Bruice	143
7. Alkenes: Structure, Nomenclature, and an Introduction to Reactivity • Thermodynamics and Kinetics Paula Y. Bruice	171
8. The Reactions of Alkenes: The Stereochemistry of Addition Reactions Paula Y. Bruice	193
9. The Reactions of Alkynes • An Introduction to Multistep Synthesis Paula Y. Bruice	233
10. Delocalized Electrons and Their Effect on Stability, pKa, and the Products of a Reaction Paula Y. Bruice	251
11. SPECIAL TOPIC II: Molecular Orbital Theory Paula Y. Bruice	301
12. Substitution Reactions of Alkyl Halides Paula Y. Bruice	309

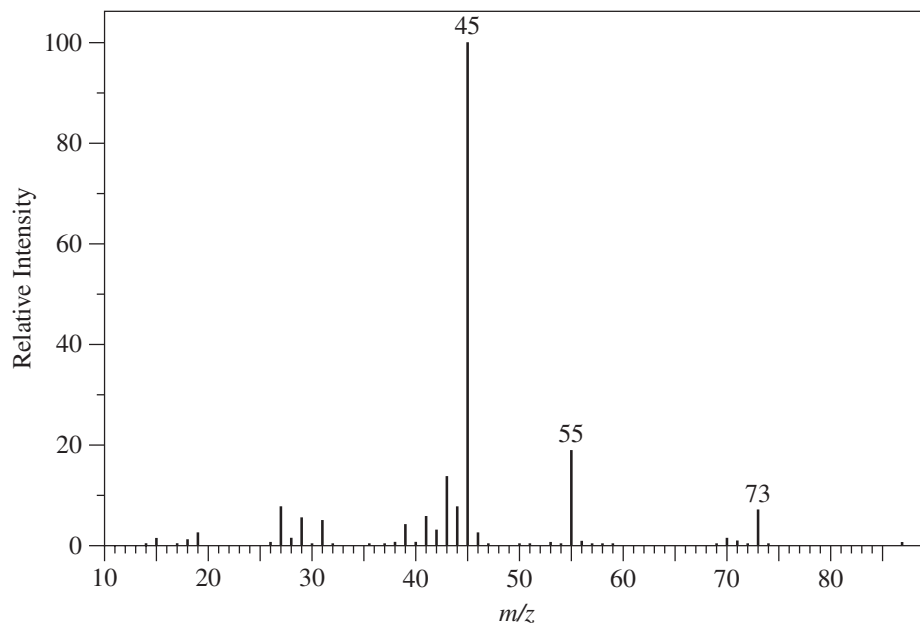
13. Elimination Reactions of Alkyl Halides • Competition Between Substitution and Elimination Paula Y. Bruice	331
14. Reactions of Alcohols, Ethers, Epoxides, Amines, and Thiols Paula Y. Bruice	359
15. Organometallic Compounds Paula Y. Bruice	399
16. Radicals • Reactions of Alkanes Paula Y. Bruice	417
17. NMR Spectroscopy Paula Y. Bruice	439
18. Mass Spectrometry, Infrared Spectroscopy, and Ultraviolet/Visible Spectroscopy Paula Y. Bruice	467
19. Reactions of Carboxylic Acids and Carboxylic Acid Derivatives Paula Y. Bruice	497
20. Reactions of Aldehydes and Ketones • More Reactions of Carboxylic Acid Derivatives • Reactions of A,B-Unsaturated Carbonyl Compounds Paula Y. Bruice	535
21. Reactions at the A-Carbon of Carbonyl Compounds Paula Y. Bruice	579
22. Reactions of Benzene and Substituted Benzenes Paula Y. Bruice	623
23. More About Amines • Reactions of Heterocyclic Compounds Paula Y. Bruice	681
24. The Organic Chemistry of Carbohydrates Paula Y. Bruice	705
25. The Organic Chemistry of Amino Acids, Peptides, and Proteins Paula Y. Bruice	735
26. Catalysis in Organic Reactions and in Enzymatic Reactions Paula Y. Bruice	767
27. The Organic Chemistry of the Coenzymes, Compounds Derived from Vitamins Paula Y. Bruice	791
28. The Organic Chemistry of the Metabolic Pathways • Terpene Biosynthesis Paula Y. Bruice	813
29. The Chemistry of the Nucleic Acids Paula Y. Bruice	835

30. Synthetic Polymers	
Paula Y. Bruice	851
31. Pericyclic Reactions	
Paula Y. Bruice	873
Index	889

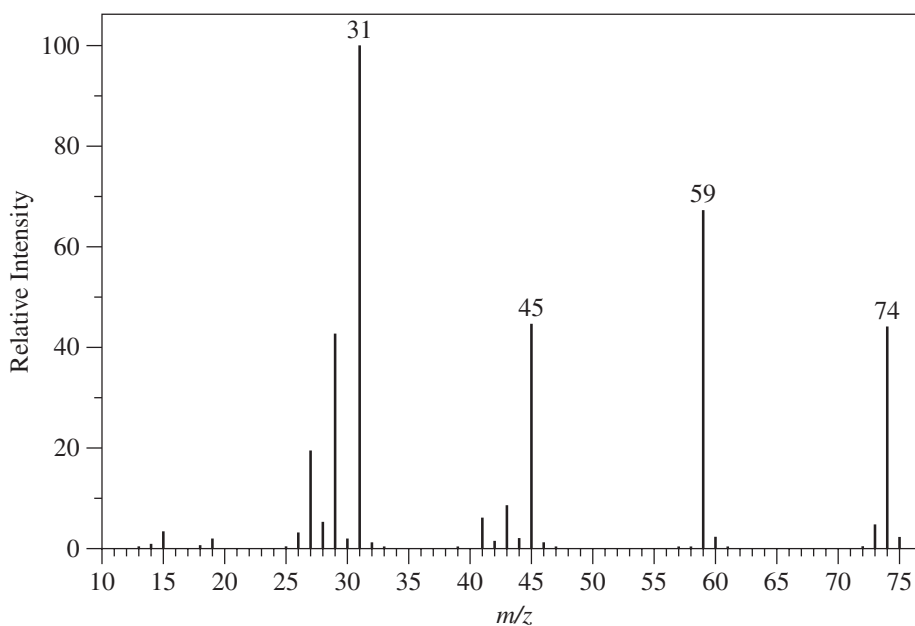
This page intentionally left blank

Spectroscopy Problems

1. Determine the structure of the straight-chain pentanol that produces the mass spectrum shown here.



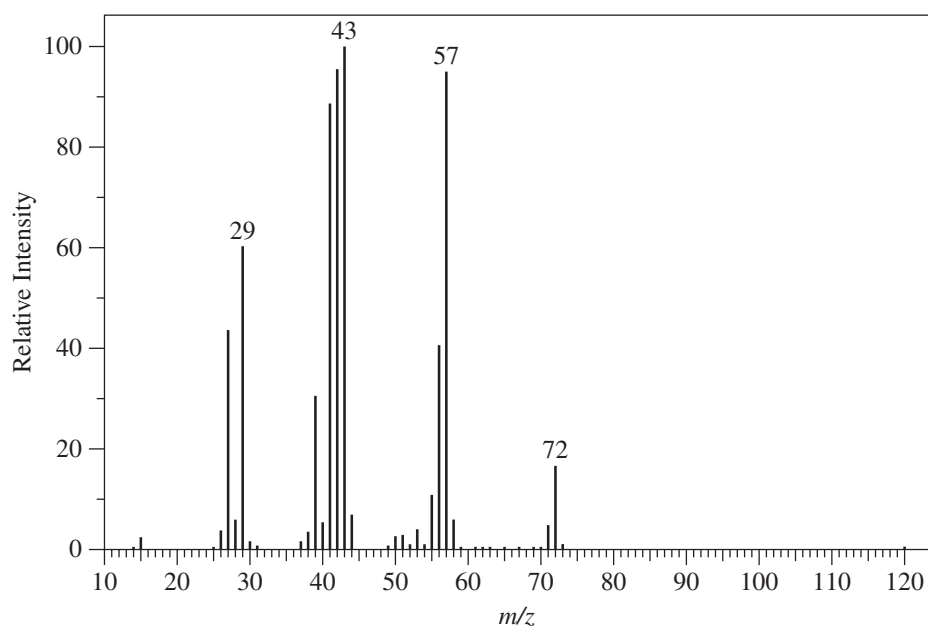
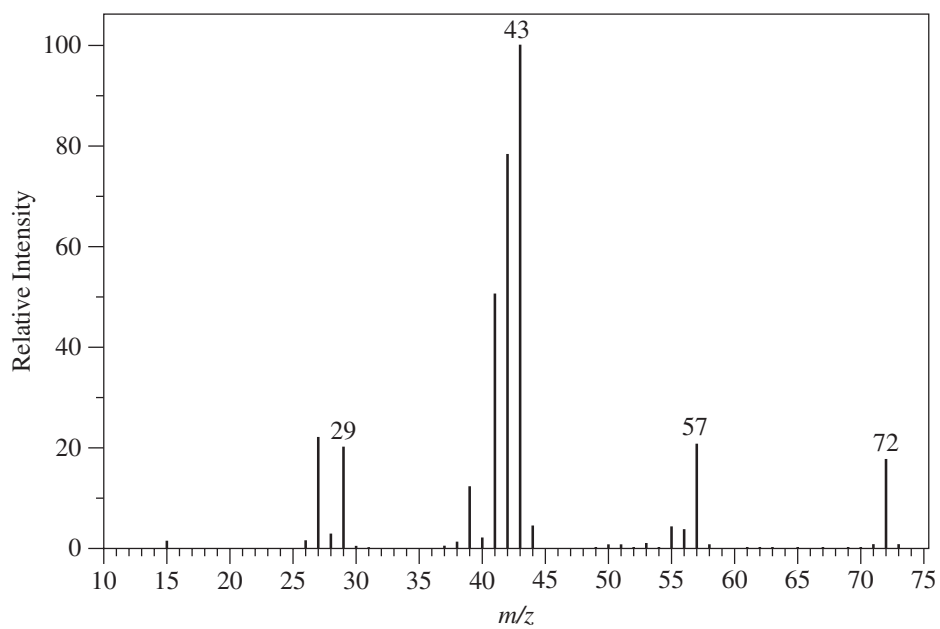
2. The mass spectrum of an ether is shown here. Determine the molecular formula of the ether that would produce this spectrum and then draw possible structures for it.



From Spectroscopy Problems of *Study Guide and Solutions Manual for Organic Chemistry*, Seventh Edition. Paula Yurkanis Bruice. Copyright © 2014 by Pearson Education, Inc. All rights reserved.

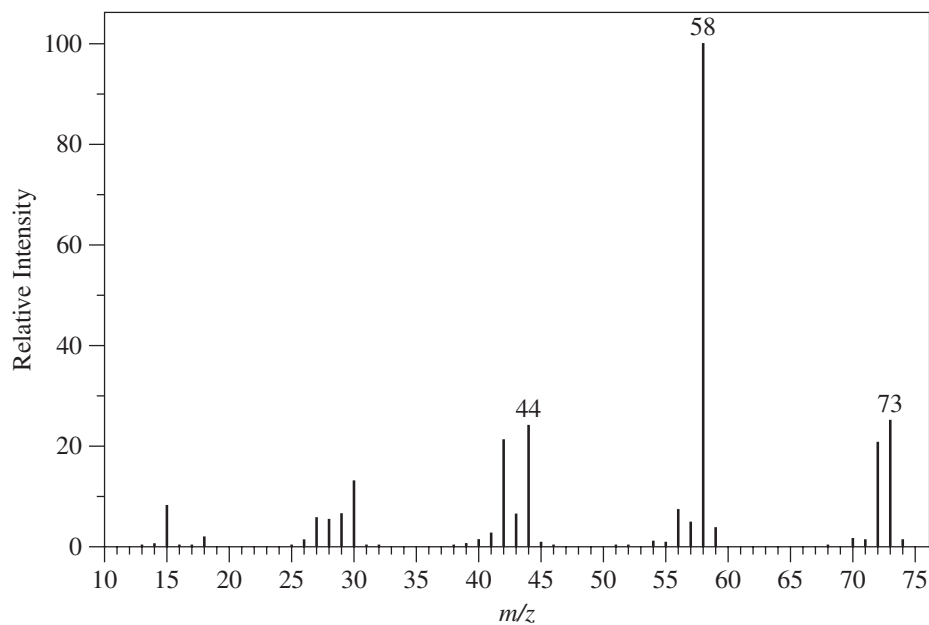
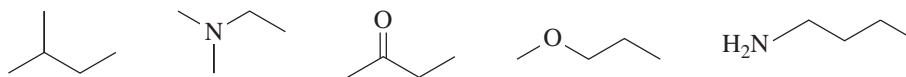
Spectroscopy Problems

3. The mass spectra of pentane and isopentane are shown here. Determine which spectrum belongs to which compound.



Spectroscopy Problems

4. Which of the following compounds gives the mass spectrum shown here?



5. An unknown acid underwent a reaction with 1-butanol. The product of the reaction gave the mass spectrum shown here. What is the product of the reaction, and what acid was used?

