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College Chemistry

Third Edition

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College Chemistry

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by Paul R. Frey

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Preface

The third edition of *College Chemistry* incorporates many comments and suggestions from instructors who have used the previous editions of the book. Like previous editions, the third edition of the book is based on a thorough coverage of fundamental principles. The elements are discussed by groups, beginning with Group VIIIA and working from right to left across the periodic table. The order and development of topics are designed to arouse and hold the student's interest, regardless of his background at the secondary school level. As far as possible, the qualitative and quantitative aspects of topics are discussed separately. Each section contains a minimum of new concepts, which means that many terminal concepts may be omitted without losing continuity of subject matter.

I am indebted to the late Dr. W. E. Pyke, and my other colleagues at Colorado State University, for their many helpful suggestions; and to Dr. Dale Maag, Head of the Department of Chemistry, for his cooperation while the manuscript was being prepared. I wish also to express my appreciation to Dr. Kenneth S. Pitzer, Dr. C. C. Robinson, and Dr. Harold M. Faigenbaum, for their suggestions and critical reviews of the manuscript for the second edition; and to Dr. Lloyd Wood, Dr. Ben King, Dr. David Sharefkin, and the late Dr. Wendell M. Latimer, for their reviews and for contributions to the first edition. I am greatly indebted, also, to Mr. George A. Rowland and the staff of the Project Planning Department of Prentice-Hall, Inc., for editing the manuscript and preparing it for publication. Special acknowledgment is given Mr. Keith G. Irwin, Professor Emeritus, Colorado State University, for suggestions in preparing many of the illustrations.

PAUL R. FREY

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The science of chemistry

The nature of chemistry

1.1 Chemistry. The word *chemistry* is a common one in our present-day vocabulary. Chemistry is the branch of natural science that is concerned with the composition and properties of matter, the transformation of one form of matter into another, the causes that bring about such changes and the energy change that accompanies them, and the laws that govern the transformations of matter and energy. To define chemistry very briefly, we could say that it is *the study of the behavior of atoms*.

If you are a careful observer, are inquisitive, and have a good imagination, you probably know more chemistry than you realize. The purpose of this book and of