

Preface

Statistics for chemists is a part of Analytical chemistry that deals with collecting, analyzing, presenting, and interpreting chemical data statistically with an advanced level of accuracy and precision. Analytical chemistry is a branch of chemistry that deals with the identification of compounds and mixtures (qualitative analysis) and the determination of the proportions of the constituents (quantitative analysis). The techniques commonly used in Analytical chemistry are titration, precipitation, spectroscopy, chromatography etc. This is the only branch of experimental science which involves a large number of measurements followed by intensive calculation. Generally, most students are reluctant in doing numerical problems, instead they prefer writing long descriptive answers in solving simple problems. This was the reason I decided to write this book on *Statistics for Chemists* through questions and answers, to equip the learner with the basic ideas and skills needed to statistically interpret their scientific research findings in a more precise and accurate manner.

This book is composed of four chapters, which include: Chapter One- Introduction to statistics for chemists; Chapter two- Significance tests: Control charts, One-way ANOVA, The Chi-squared (X^2) test and Testing for Normality of Distribution; Chapter three- Errors in Instrumental Analysis: Regression Lines and Correlation and Calibration Graphs in Instrumental Analysis; Chapter four- Experimental and Factorial Design: Experimental Design and Optimization (Randomization and Blocking) and Factorial Design and Optimization.

For the ease in tackling the questions, a thorough comprehensive of theoretical aspects of each topic as been captured in this book. The indispensable questions and answers are provided in every chapter. At the end of the write-up references which I have used while compiling this book are appended to indicate the source of similar problems. However, to get greater and clearer knowledge the reader may also refer to *Statistics and Chemometrics for Analytical Chemistry, Sixth Edition by James N. Miller and Jane C. Miller*, or to any other statistics in Analytical Chemistry text book. Due to online learning and examinations, which as been greatly necessitated by COVID-19 Pandemic, multiple choice questions alongside the long answer and calculation questions with their respective solutions have been provided.

I take this opportunity to appreciate the publisher of this book, for their wonderful production. I also acknowledge the students that I have interacted and would interact with in the future in the statistics for chemists lectures in the Department of Chemistry, University of Nairobi in Kenya. I would be failing in my Duty if I fail to Acknowledge my Husband Prof. Kithure Kindiki and our three kids: Anne Imani, Peace Neema and Favour Mwendu, for their patience and for creating conducive atmosphere for writing this Book. Worthwhile comments and suggestions are welcome from the readers.