1. Record Nr. UNINA9910133222703321

Autore	Cornell John A. <1941->
Titolo	A primer on experiments with mixtures [[electronic resource] /] / John A. Cornell
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, c2011
ISBN	1-283-29452-4 9786613294524 1-118-12516-9 0-470-90744-4 0-470-90742-8
Descrizione fisica	1 online resource (376 p.)
Collana	Wiley series in probability and statistics
Disciplina	660.294 660/.294
Soggetti	Mixtures - Experiments Mixtures - Mathematical models Powders - Mixing - Experiments Powders - Mixing - Mathematical models Solution (Chemistry) - Experiments Solution (Chemistry) - Mathematical models
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	A Primer on Experiments with Mixtures; Contents; Preface; 1. Introduction; 1.1 The Original Mixture Problem; 1.2 A Pesticide Example Involving Two Chemicals; 1.3 General Remarks About Response Surface Methods; 1.4 An Historical Perspective; References and Recommended Reading; Questions; Appendix 1A: Testing for Nonlinear Blending of the Two Chemicals Vendex and Kelthane While Measuring the Average Percent Mortality (APM) of Mites; 2. The Original Mixture Problem: Designs and Models for Exploring the Entire Simplex Factor Space; 2.1 The Simplex-Lattice Designs; 2.2 The Canonical Polynomials 2.3 The Polynomial Coefficients As Functions of the Responses at the Points of the Lattices2.4 Estimating The Parameters in the {q,m}

Polynomials; 2.5 Properties of the Estimate of the Response y(x); 2.6 A Three-Component Yarn Example Using A {3, 2} Simplex-Lattice Design; 2.7 The Analysis of Variance Table; 2.8 Analysis of Variance Calculations of the Yarn Elongation Data; 2.9 The Plotting of Individual Residuals; 2.10 Testing the Degree of the Fitted Model: A Quadratic Model or Planar Model?; 2.11 Testing Model Lack of Fit Using Extra Points and Replicated Observations
2.12 The Simplex-Centroid Design and Associated Polynomial Model2. 13 An Application of a Four-Component Simplex-Centroid Design: Blending Chemical Pesticides for Control of Mites; 2.14 Axial Designs; 2.15 Comments on a Comparison Made Between An Augmented Simplex-Centroid Design and a Full Cubic Lattice for Three Components Where Each Design Contains Ten Points; 2.16 Reparameterizing Scheff e's Mixture Models to Contain A Constant (0) Term: A Numerical Example; 2.17 Questions to Consider at the Planning Stages of a Mixture Experiment; 2.18 Summary; References and Recommended Reading
QuestionsAppendix 2A: Least-Squares Estimation Formula for the Polynomial Coefficients and Their Variances: Matrix Notation; Appendix 2B: Cubic and Quartic Polynomials and Formulas for the Estimates of the Coefficients; Appendix 2C: The Partitioning of the Sources in the Analysis of Variance Table When Fitting the Scheffe Mixture Models; 3. Multiple Constraints on the Component Proportions; 3.1 Lower-Bound Restrictions on Some or All of the Component Proportions; 3.2 Introducing L-Pseudocomponents; 3.3 A Numerical Example of Fitting An L-Pseudocomponent Model
3.4 Upper-Bound Restrictions on Some or All Component Proportions3. 5 An Example of the Placing of an Upper Bound on a Single Component: The Formulation of a Tropical Beverage; 3.6 Introducing U-Pseudocomponents; 3.7 The Placing of Both Upper and Lower Bounds on the Component Proportions; 3.8 Formulas For Enumerating the Number of Extreme Vertices, Edges, and Two-Dimensional Faces of the Constrained Region; 3.9 McLean and Anderson's Algorithm For Calculating the Coordinates of the Extreme Vertices of a Constrained Region; 3.10 Multicomponent Constraints
3.11 Some Examples of Designs for Constrained Mixture Regions: CONVRT and CONAEV Programs

Sommario/riassunto

The concise yet authoritative presentation of key techniques for basic mixtures experiments Inspired by the author's bestselling advanced book on the topic, A Primer on Experiments with Mixtures provides an introductory presentation of the key principles behind experimenting with mixtures. Outlining useful techniques through an applied approach with examples from real research situations, the book supplies a comprehensive discussion of how to design and set up basic mixture experiments, then analyze the data and draw inferences from results. Drawing from his extensive experi