



Workshop

Methods for Designing & Analyzing Mixture Experiments

Summary:

Mixture experiments involve varying the component proportions of a product and observing the changes in the product's properties. The component proportions cannot be varied independently because they must sum to 1.0 for each run in the experiment. Mixture experiments are useful in many product development areas, including foods, drinks, drugs, plastics, alloys, ceramics, glass, gasoline, fertilizers, and others. The course will provide an overview of approaches and methods used in designing mixture experiments and analyzing the resulting data. Designs for simplex-shaped and irregular-shaped regions (the latter resulting from constraints on the component proportions) will be covered. Various types of mixture models for fitting to mixture data will be discussed, as will graphical techniques for interpreting component effects. Including process variables and/or a total amount variable in mixture experiments will be covered. Graphical and analytic methods for developing mixtures with optimum properties will also be discussed. Many examples from the presenter's experiences will be used to illustrate the topics. The course is designed for statisticians and non-statisticians wanting to know about statistical methods for designing mixture experiments and analyzing the resulting data. Prerequisites are an understanding of basic statistics concepts and some previous exposure to experimental design and regression.

Presenter:

Dr. Greg Piepel is a Laboratory Fellow in the Applied Statistics and Computational Modeling Group at Pacific Northwest National Laboratory operated by Battelle Memorial Institute. He works as an applied statistician on multi-disciplinary research projects in the physical and engineering sciences. He has developed and applied mixture experiment techniques to a wide variety of problems (e.g., glass, ceramics, cement, stainless steel, aluminum production, drugs) over the past 32 years. He has over 150 publications and technical reports in the areas of mixture experiments, experimental design, and others. Dr. Piepel is also the principal of MIXSOFT, a company through which he teaches mixture experiment short courses and develops/sells the MIXSOFT software toolkit for the design and analysis of mixture experiments. Dr. Piepel is a Fellow of the American Statistical Association and the American Society for Quality.

Workshop type:

Full day.

Date:

September 08, 2011.

Registration and further information:

http://www.enbis.org/events/current/96_ENBIS_11_Coimbra/programmeitem/892_Methods_for_Designing___Analyzing_Mixture_Experiments