

Usage of multivariate optimization techniques in drug analysis using spectrophotometric methods

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During developing an analytical method, investigating the effects of several experimental variables on the response from analytical devices is important in terms of optimizing a developed method. One-factor-at-a-time approach is a traditional optimization technique for describing optimal experimental conditions. Owing to some disadvantages of this technique such as high consumption amount of solvent and sample, waste of time, dissipation of energy and high cost, in recent years, multivariate approaches has been used for accomplishing these problems. In multivariate optimization techniques, several variables effects on response are evaluated simultaneously and results are determined as contour graphics and equations. Helping with these equations containing coefficients, the value of the one factor was calculated for providing the optimum experimental conditions when the other factors were valued while the graphics are enabled to monitoring the effects of experimental variables on responses visually. Determination of active ingredients in pharmaceutical preparations becomes more difficult when the number of the active components increase in the mixture and the presence of interference from excipients in the preparations. In addition to the chromatographic techniques, chemometric techniques (multivariate calibration techniques), based on the computer aided instrumentation and algorithms, are used for resolving mixtures and employed for the analysis of multi-component samples. Multivariate optimization techniques reduce the time for optimization studies via investigating the influence of factors on response in chemometric techniques, simultaneously and contributed the utility of this analytical technique.

Biography

Ismail Murat Palabiyik graduated from Faculty of Pharmacy, University of Ankara and obtained Ph.D. from Department of Analytical Chemistry, Faculty of Pharmacy, University of Ankara. Currently, he is working in same department. His current research is developing analytical techniques for drug analysis from dosage forms and biological fluids using with capillary electrophoresis, high performance liquid chromatography, spectrofluorimetry and UV spectrophotometry. Beside this, for investigating effects of experimental factors on analysis in HPLC and CE methods, he utilized Response Surface Methodology (RSM). Also, he is specialized in chemometry especially in drug analysis. Also, he worked one year in department of pharmacology and studied diabetes treatment. He is a Visiting Scholar, Katholieke Universiteit Leuven, Faculty of Pharmacy, Laboratory of Pharmaceutical Chemistry and Drug Analysis and worked with Professor Jos Hoogmartens group in liquid chromatographic column characterization. During his M.Sc and Ph.D. period, he took a fellowship from TÜBİTAK-BİDEB, The Scientific Research and Technological Council of Turkey. His Ph.D. thesis was awarded by University of Ankara. He is a reviewer for journals like Journal of Pharmaceutical and Biomedical Analysis, Journal of AOAC International, Journal of Liquid Chromatography & Related Technologies, Chemical Industry & Chemical Engineering Quarterly and Journal of Chromatographic Science, African Journal of Pharmacy and Pharmacology, African Journal of Biotechnology and Turkish Journal of Pharmaceutical Sciences. He is an editorial board member of Pharmaceutica Analytica Acta and Pharmaceutical Regulatory Affairs.

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