

Central composite design as a tools for optimization of antioxidant activity on cocoa shell extract

ABSTRACT

This study seeks to analyze and optimize the antioxidant activity thru beta carotene bleaching assay influenced by different extraction condition on extracts obtained from Malaysia Cocoa Shell. The condition was optimized by response surface methodology with five levels of the model. There are three variables involved in this study, namely: ethanol concentration (70-90 v/v %), temperature (45-65 °C), and ultrasound irradiation time (30-60 min). The optimum condition obtains for temperature, duration of extraction and solvent concentration were 55 °C, 45 minutes and 63.18% respectively at a constant frequency of 40 kHz. In this condition, the antioxidant activity experimental was $98.91 \pm 0.5\%$ and predicted 98.44%. The ANOVA shows the coefficient of determination (R^2) and the lack of fit test was 0.9846 and 0.6105 respectively. The desirability function from T-test data, modeled equation fits the data, reveals that the design can be used to predicting future observation within the design range.

Keyword: Antioxidant; Cocoa shells and response surface methodology