DEVELOPMENT OF MATHEMATICAL MODELS FOR EXTRACTION OF POLYPHENOLS FROM WASTE ALLIVUM SATIVUM HUSK

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ABSTRACT

A modeling technique based on extraction time and absorbed energy density was proposed to model microwave assisted extraction (MAE) of polyphenolic compounds from waste *Allium sativum* husk. The process parameters such as temperature, time, solvent to feed ratio was varied to study the extraction profile at various microwave power (100 W to 400 W). The film theory was modified based on the Absorbed Energy Density. The extraction coefficients were determined using Mat lab curve fitting tool. Then the coefficients were used to predict the extraction efficiency value. The percentage error between the experimental and predicted value showed that the AED model was more adaptable to predict the extraction profile of polyphenols. Thus the AED-based extraction model is reliable and could be applied to various microwave extractors and it is useful for scaling up process. In addition, estimation of suitable extraction time of MAE based on AED for equilibrium extraction is feasible and which can be used to determine the range of extraction conditions prior to the optimization study.

Keywords: Allivum sativum, Absorbed Energy Density, Film theory, Polyphenol