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Abstract
The pharmacy industry is a technology industry highly depending on research and development and can upgrade its competitiveness by reducing the cost of research and development. The medicine research must consider multiple quality characteristics such as process operating conditions, component proportions, and human reaction after taking the medicine. Therefore, how to use effective and low cost’s experiment method which considering multiple quality characteristics to study for medicines becomes an important subject.

The medicine formulation is a mixture that contains more than one component. The quality characteristics are decided by its component proportions. Mixture experimental design is a method that considers component proportions. It accords with the demand of the pharmacy industry. Besides considering the component proportions of the mixture, it also takes component upper and lower bounds into consideration. Through response surface analysis, one can get the prediction model and search for the best component proportions to optimize quality characteristics.

This research is to study SUZIN Capsule considering the effects of component proportions and mixture amount on its quality characteristics. Using symmetric-simplex design to study its formulation and search for the prediction model of each quality characteristic. Furthermore, consider multiple quality characteristics to find out the optimal formulation. Desirability function, genetic algorithms combining artificial neural networks, and grey relational analysis are used to solve the problem. In addition, analytic hierarchy process (AHP) is applied to obtain objective weights of quality characteristics.
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