عنوان مقاله:

Application of Artificial Neural Networks in the Modeling of Drug Release from Acyclovir Nanoparticles

محل انتشار:

پانزدهمین کنگره ملی مهندسی شیمی ایران (سال: 1393)

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خلاصه مقاله:

Formulation of controlled release acyclovir loaded chitosan nanoparticles was optimized based on the optimization technique using response surface method (RSM) and artificial neural network (ANN) simultaneously to develop a model to identify relationships between variables affectingdrug nanoparticles. In this research, the goal was to create a representation of three irregular factors, i.e. concentration of acyclovir, concentration ratio of chitosan/ Tripolyphosphate (TPP) and pH on response variables. ANN was used to create a fit model of formulations via these four training algorithms including: Levenberg–Marquardt (LM), Gradient Descent (GD), Bayesian– Regularization (BR) and BFGS Quasi-Newton (BFG) were applied to train ANN containing a various hidden layer, applying the testable data as the training set.Corresponding to batch back propagation (BBP)-ANN performance, a gain in pH of polymer solution reduced the size and polydispersity index (PdI) of nanoparticles. Moreover, decreases in the concentration ratio of chitosan/TPP consequently cause an increase in entrapment efficiency (%EE).For this reason each training algorithm in order to consider the accuracy of predictive ability was evaluated and the result was as follow: LM > BFGs > GD > BR.

کلمات کلیدی:

Acyclovir,Artificial neural network (ANN),Backpropagation,Drug delivery, Response surface methodology (RSM), Training algorithms

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