Lipase-catalysed synthesis of a novel galanthamine derivative: process optimisation byartificial neural networks

ABSTRACT

Artificial neural networks (ANNs) analysis was carried out to optimize the esterification of galanthamine and acetic acid in a solvent system. To predict performance parameters of the enzymatic reaction conditions, several parameters were studied which were reaction temperature (50–90 °C), enzyme amount (2–5 wt%), reaction time (6–18 h), and substrate molar ratio of galanthamine to acetic acid (2–5:1). The algoritms used in the network were batch back propagation (BBP), incremental back propagation (IBP), genetic algorithm (GA), Levenberg–Marguardt (LM) and quick propagation (QP) algorithms. The configuration of 4 inputs, one hidden layer with 7 nodes, and 1 output using the batch back propagation (BBP) was determined as the optimum algorithm. The predicted and experimental percentage yield value were 60.24% and 60.36%, respectively. These results prove the validity of ANN model.

Keyword: Galanthamine derivative artificial neural networks (ANNs); Optimization lipase-catalysed synthesis