Optimal Preparation of Polyelectrolyte Complexes of Chitosan Self-assembled with Fucoidan

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The preparation conditions for both a high yield without aggregation and a small mean-size of chitosan-fucoidan nanoparticles were sought by a screening method, i.e., discarding the ones satisfying neither of both to prepare them by polyelectrolyte complexation with chitosan and fucoidan. The nanopartices tended to grow as the pH of chitosan increased up to 3.69, after which they became smaller. This pattern of growth is prominent as the mass ratio of chitosan and fucoidan decrease. The conditions of pH 5 and 1:1 chitosan-fucoidan mass ratio were suggested as ad hoc optimum conditions by the screening method to prepare chitosan-fucoidan nanoparticles for high yield, small size and good suspension stability. They were almost consistent with the optimum conditions for the maximum value of chitosan-fucoidan nanoaprticles prepared per unit input mass, which were analyzed by response surface methodology (RSM).