

Influence of process variables and formulation composition on sphericity and diameter of Ca-alginate-chitosan liquid core capsule prepared by extrusion dripping method

ABSTRACT

The influence of process variables and formulation composition on the sphericity and diameter of the alginate capsules which contained dual cations (Ca-and-chitosan) are characterized in this study. Capsule sphericity was not influenced by needle diameter but instead, capsule diameter increased proportionally with the needle diameter. The combined effects of the liquid core solution and alginate solution on the sphericity of the capsules are tabulated. Spherical capsules can be produced when the following criteria were fulfilled: stirring speed is in the range of 240–300 rpm; calcium chloride concentration is >5 g/L; viscosity of liquid core solution is >203 mPa.s; as well as viscosity of alginate solution is in between 47 and 386 mPa.s. The capsule diameter was predicted using a modified Tate's law equation and an error analysis was conducted to evaluate the equation. The predicted diameter was well correlated with the experimental data with an average absolute deviation $<3.6\%$.