

The effect of low air-to-liquid mass flow rate ratios on the size, size distribution and shape of calcium alginate particles produced using the atomization method

Abstract

This study investigated the effects of atomization at low air-to-liquid mass flow rate ratios on the size, size distribution and shape of the calcium alginate (Ca-alginate) particles produced. It was found that the air-to-liquid mass flow rate ratio must be greater than 0.0011 to atomize a 20 g/L sodium alginate solution. Ca-alginate particles with a broad mean sizes ranging from 50 to 2300 μm were produced using an air-to-liquid mass flow rate ratio lower than 3.5. The change in particle size was most significant when the air-to-liquid mass flow rate ratio was below a critical value 0.25. An increase in the air-to-liquid mass flow rate ratio decreased the mean particle size but increased the particle size distribution. The particles became more spherical with an increase in the air-to-liquid mass flow rate ratio.