Preparation and characterization of alginate beads by drop weight

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The preparation and characterization of macro alginate beads are always associated with appropriate techniques involving precise measurement of shape, size, volume and density of the products. Depending on the type of application, encapsulation of macro alginate beads can be accomplished by various techniques including chemical, ionotropic, physical and mechanical methods. This work describes a method for preparing macro alginate beads through drop weight. The macro beads (2.85–3.85 mm) were prepared via different concentrations of alginate (0.5, 1.0, 1.5 and 2.0 g/L), dripping tip size (0.04–0.14 cm) and immersion into a predetermined concentration of calcium chloride (CaCl2) bath. A custom made dripping vessel fabricated from acrylic plastic, connected to an adjustable dripping clamp was used to simulate the dripping process of the molten alginate at different tip sizes. It was observed that at different dripping tips, the correction factor for the alginate slurry was found in the range of 0.73–0.83. Meanwhile, the lost factor, KLF was observed at 0.93–2.3 and the shrinkage factors were limited to 2.00% from the overall distributed data. It was concluded that liquid properties had no effect on the liquid lost factor. The bead size prediction for different concentrations of alginate solution was compared to the experimental data. Subsequently, it was concluded that increasing the tip size caused the bead size to deviate almost 20% when compared to the experimental and predicted values, respectively.