

Static agglomeration of food powder mixtures: influence of addition of an "inert" ingredient

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In the food industry, the term sintering usually refers to static agglomeration resulting from the bridge formation that occurs between neighbouring particles when an amorphous powder is exposed to temperatures above its glass transition temperature (T_g). Addition of an "inert" (i.e. a non-sintering) ingredient to the amorphous powder can have a major influence on the physical properties of the sintered product.

In this study, a sintering ingredient was mixed with an inert one using dry mixing, and the mixture was subjected to different temperature (T) and relative humidity (RH), above the T_g of the sintering ingredient. Different concentrations and particle size distributions of the inert ingredient were tested. It is shown that the particle size of the inert ingredient can have a significant effect on the physical properties of the final product. It is also demonstrated that a threshold concentration of the inert ingredient exists above which the sintering degree is not significant (within the range of conditions studied here). Finally, this study explores the differences between a purely thermal sintering process and a moisture-induced one, at the same T-T_g.