

Gelatinization of Individual Starch Granules

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ABSTRACT

Starch gelatinization is key to starch's ability to affect the rheology of a large number of consumer products and food in particular. During gelatinization, starch granules swell as the intermolecular bonds within the granules are disrupted, resulting in the release of amylose and amylopectin which increase the solution viscosity. Because starch originates as granules formed in plants, we employ a Particle Cohort Study (or ParCS) to track individual granules and provide useful insight into the gelatinization process. In this work, we study the swelling of individual pulse-starch granules and define new parameters to characterize the swelling. We also present a new algorithm to for analyzing a common rheological test used industrially called starch pasting. The results are compared with dynamic scanning calorimetry to validate our results.