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RAMAIAH Institute of Technology

PROJECT POSTER PRESENTATION

CONTINUOUS PROCESSING OF STARCH USING A SINGLE SCREW PROCESSOR

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BACKGROUND

Starch, composed of amylose and amylopectin chains, is crystalline and less digestible until gelatinized, a process involving amylose leaching when heated. Gelatinization alters starch into a digestible amorphous form, with viscosity changes indicating granule expansion and rupture. This transformation is crucial for understanding starch properties, which is achieved through batch and continuous processing, the latter using a single screw processor for Pregel starch production.

OBJECTIVES

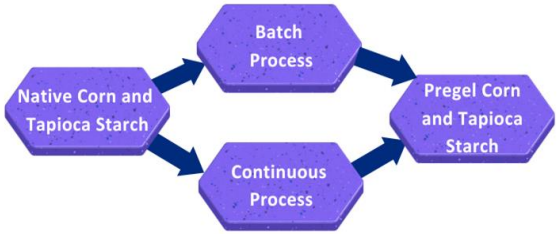
- Parametric study of effect of process parameters such as temperature, moisture, screw speed, on Degree of Gelatinization (Dg) and shear viscosity of starch.
- Develop correlation between Degree of Gelatinization and shear viscosity.

APPLICATIONS

- Food Industry: Pregel starches serve as thickeners in millet mixes, enhancing texture, stability, and shelf life of food products, e.g, soups, sauces.
- Pharmaceutical Industry: Utilized as binders and controlled-release agents in tablet formulations for improved drug delivery.
- Agricultural Industry: Applied as super-absorbent polymers or hydrogel patches in drought-prone areas to enhance water retention in soil, aiding crop growth and productivity.

METHODOLOGY

1. Modification of Native Starches



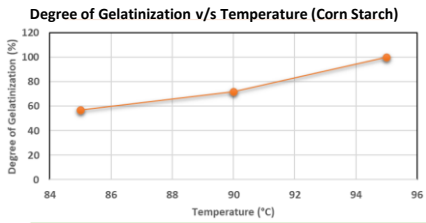
2. Characterization of Pregel Starches

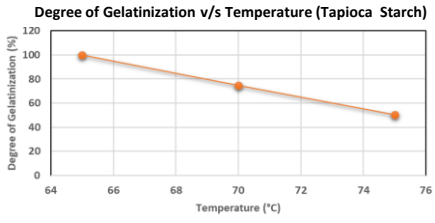
3. Determination of Degree of Gelatinization

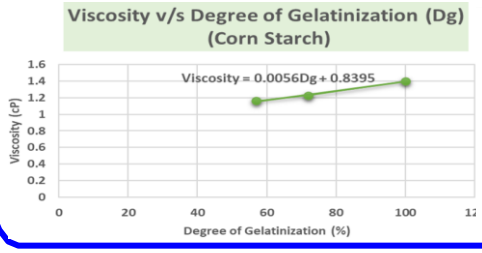
4. Determination of Viscosity

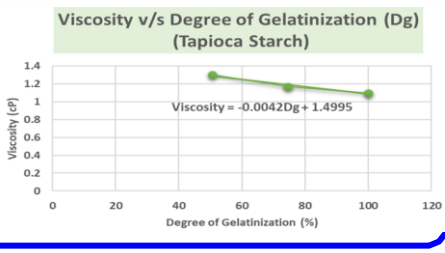
RESULTS

Sl. No.	Sample	Bulk Density ρA (g/mL)	Tap Density ρT (g/mL)	Carr's Index	Hausner's ratio	Flowability
1	Pregel Corn Starch	0.9259	1	7.41	1.08	Excellent
2	Pregel Tapioca Starch	0.8937	0.9625	7.14	1.076	Excellent









CONCLUSION

The conversion of native crystalline starches to Pregel amorphous starches via extrusion, particularly with a single screw processor, offers efficient large-scale production with improved flowability and viscosity. This transformation enhances thickening power, stability, texture, binding, controlled release, and processing efficiency, influenced by the degree of gelatinization and gelatinization temperature specific to each starch type, ultimately impacting digestibility and nutritional properties.

ACKNOWLEDGEMENT

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