

Pasting, Morphological and Functional Properties of Breadfruit (*Artocarpus altilis*) Starch Cross-linked with Ethylene glycol Dimethacrylate

Kehinde N Awokoya^{1*}, Vincent O Oninla¹, Adeola A Ibikunle², Adewale O Adebajo², Abimbola O Okunniyi¹ and Bridget A Moronkola³

¹Obafemi Awolowo University, Nigeria

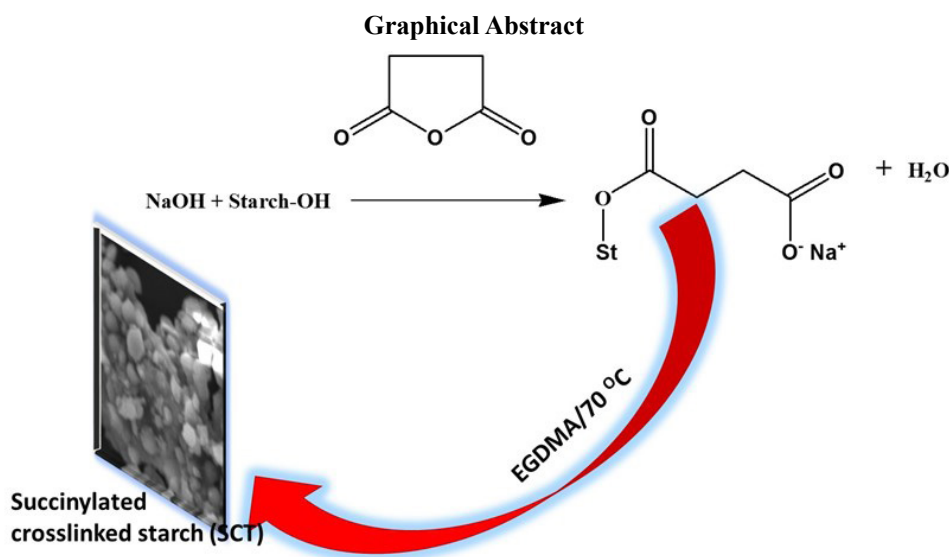
²Olabisi Onabanjo University, Nigeria

³Lagos State University, Nigeria

A novel succinylated cross linked starch was prepared by using ethylene glycol dimethacrylate (EGDMA) as a cross linker. In this current research, the study was designed to investigate the influence of single and dual chemical modifications on functional, pasting and morphological properties of starch extracted from breadfruit. The extracted starch was chemically modified to produce succinylated (SST) and succinylated-crosslinked starches (SCT). Proximate analysis revealed that following modifications, SST starches retained higher moisture content compared to native starch, while SCT starch had lower moisture content. Crude protein, crude fibre, crude fat and total ash of the native starch reduced following succinylation but increased after crosslinking. Scanning electron microscopy (SEM) revealed that crosslinked granules were not uniformly distributed but formed some aggregates. The absorption bands of the carbonyl group at 1784 and 1716 cm^{-1} appeared in FTIR spectra. The result indicates that all forms of modification reduced the water binding capacity of native breadfruit starch. Gelation studies revealed that cross linked breadfruit starch had a superior gelating property than the succinylated and native starches. The values of 94.70 and 79.95 $^{\circ}\text{C}$ obtained for the pasting temperature of SST and SCT respectively were higher than corresponding value of 79.90 $^{\circ}\text{C}$ listed for native starch. All forms of modification reduced peak viscosity, trough viscosity, breakdown viscosity and final viscosity of the native starch. Setback viscosity reduced after succinylation but increased in cross linked derivative, indicating less syneresis is likely to take place within the starch helices.

Keywords:

Breadfruit starch Physicochemical properties Succinic anhydride Ethylene glycol dimethacrylate Cross linking



Biography:

Kehinde N Awokoya is presently working as a Lecturer in Polymer and Supramolecular Chemistry in the Department of Chemistry at Awolowo University, Nigeria.