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## Reduction of gelatinization temperatures of starch blend suspensions with supercritical CO<sub>2</sub> treatment

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### JOURNAL OF SUPERCRITICAL FLUIDS

Volume: 95 Pages: 499-505

DOI: 10.1016/j.supflu.2014.10.026

Published: NOV 2014

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### Abstract

Modification of starch blend properties by contact with supercritical carbon dioxide (scCO<sub>2</sub>) was studied. Potato starch (PS), sweet potato starch (SPS), and cassava starch (CS) were blended with wheat starch (WS) at 15, 25, 50, 75 and 85% (w/w) ratios. For WS, the maximum decrease in gelatinization temperature (T-P) was 13 degrees C. The WS-PS and WS-CS blends exhibited a decrease in T-P of 13 to 17 degrees C. Reduction in T-P by treatment was 10 to 18 degrees C for all blend ratios. Conditions for lowering the starch blend T-P were determined to be a minimum contact time of 1 h with scCO<sub>2</sub> at 60 degrees C and 20 MPa. Swelling of starch granules that leads to the lowering of T-P involves both kinetic and physicochemical factors. Gelatinization of wheat starch blends with scCO<sub>2</sub> pressure treatment provides a versatile and non-thermal method for modifying the properties of ingredients used in food processing applications. (C) 2014 Elsevier B.V. All rights reserved.

### Keywords

**Author Keywords:** Carbohydrate; Gelatinization temperature; Differential scanning calorimetry; Starch modification; Food processing

**KeyWords Plus:** CARBON-DIOXIDE; SWEET-POTATO; WHEAT-FLOUR; CASSAVA; YAM; MIXTURES; PRESSURE; CORN; CULTIVARS; QUALITY

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Japan Society for the Promotion of Science (JSPS)	

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### Publisher

ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

### Categories / Classification

**Research Areas:** Chemistry; Engineering

**Web of Science Categories:** Chemistry, Physical; Engineering, Chemical

### Document Information

**Document Type:** Article

**Language:** English

**Accession Number:** WOS:000347360800057

**ISSN:** 0896-8446

**eISSN:** 1872-8162

### Journal Information

**Impact Factor:** [Journal Citation Reports](#)

### Other Information

**IDS Number:** AY1NY

**Cited References in Web of Science Core Collection:** 31

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