

ABSTRACT

Dynamic Moisture Sorption Characteristics of Enzyme-Resistant Recrystallized Cassava Starch

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The interaction of moisture with enzymeresistant recrystallized starch, prepared by heat-moisture treatment of debranched acid-modified or debranched non-acid-modified cassava starch, was investigated in comparison with the native granules. Crystallinities of the powdered products were estimated by X-ray diffraction. Moisture sorption was determined using dynamic vapor sorption analyzer and data fitted to various models. Percent crystallinities of native starch (NS), non-acidmodified recrystallized starch (NAMRS), and acid-modified recrystallized starch (AMRS) were 39.7, 51.9, and 56.1%, respectively. In a_w below 0.8, sorption decreased in the order NS > NAMRS > AMRS in line with increasing sample crystallinities but did not follow this crystallinity dependence at higher a_w because of condensation and polymer dissolution effects. Adsorbed moisture became internally absorbed in NS but not in NAMRS and AMRS, which might explain the high resistance of the recrystallized starches to digestion because enzyme and starch cannot approach each other over fairly sufficient surface at the molecular level.

Key words: Starch Types, Crystallinity, Moisture Sorption, Internal Moisture Absorption