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73 Hydrolysis of native wheat starch by an alpha-amylase from *Bacillus subtilis*. P.Colonna , A, Buleon and Christiane Mercier , Institut National de la Recherche Agronomique, Rue de la Géraudiére, 44072 Nantes Cédex , France.

Suspensions (2%) of native starch granules from wheat have been degraded by an alpha-amylase from *Bacillus subtilis*. Crystalline fractions have been prepared either by crystallization from short chain amylose or mild acid hydrolysis of native wheat starch. Complete (98%) depolymerization into small soluble oligosaccharides is obtained within 24h at high enzyme concentrations (above 189 microg. protein/mL). Electron microscopy, particle size analysis, differential scanning calorimetry and X-ray diffractometry reveal that enzymic degradation occurs granule-by-granule: the enzyme does not preferentially hydrolyze the more amorphous regions of the granules. Intrinsic viscosity, gel permeation chromatography on Sepharose CL-2B show off that the remaining material has a macromolecular structure close to the native starch: there is no preferntial hydrolysis of either amylose or amylopectin. In contrast, acid erodes simultaneously all the granules, leading to a splitting into small crystalline particles. *De novo* crystalline fractions are completely degraded by alpha-amylase. These results support evidence for an active disentanglement of chains, carried out by the different subsites of alpha-amylase molecules. A simple mathematical treatment is proposed in order to explain the results of the kinetics.

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