



Contribution ID: 18

Type: Poster

Crystal structure of V-amylose inclusion complexes: new developments and some surprises

Amylose forms crystalline inclusion compounds with a large variety of small molecules (alcohols, fatty acids, aroma compounds, etc.). In these crystallosolvates, the so-called "V-amylose" occurs as single helices and the ligands can be located inside the helices, in-between or both. Previous exploratory studies of V-amylose polymorphism like those by Takeo and Kuge [1] or Yamashita and coll. [2] in the 60-70's, and Chanzy's group [3] in the 80-90's have produced several tentative molecular models based on 6-, 7- and 8-fold single helices. However, only a small number of structures have been characterized by crystallographic methods. By analyzing model lamellar crystals prepared from dilute aqueous amylose solutions by a combination of TEM imaging and electron and X-ray diffraction, our results show that polymorphism is a more general behavior than previously known. Depending on the crystallization conditions (crystallization temperature, concentration of complexing agents, solvent composition), a number of ligands induced the formation of distinct allomorphs. Moreover, several new allomorphs prepared with specific ligands have been identified. Some allomorphs exhibited nearly identical morphologies and were only distinguished by diffraction techniques. ¹³C CP/MAS NMR data also confirmed that the chemical shift of the carbon C1 of the glucose unit would be a good indicator of the amylose helical conformation (6-, 7- or 8-fold). In view of these results, it is likely that new crystal forms of V-amylose still remain to be discovered.

We thank LabEx Arcane (Grenoble) for the financial support of C.A.K. Le's PhD, and the ICMG-NanoBio platform (Grenoble) for granting access to the Electron Microscopy facility.

1. K.-I. Takeo, T. Kuge, *Agric. Biol. Chem.* 33 (1969), 1174-1180.
2. Y.-H. Yamashita, J. Ryugo, K. Monobe, *J. Electron Microsc.* 22 (1973), 19-26.
3. W. Helbert, "Données sur la structure du grain d'amidon et des produits de recristallisation de l'amylose", Doctoral dissertation, Université de Grenoble 1, 1994.

Preferred topic

Solid state - crystallosolvates

Primary authors: Mr LE, Cong-Anh-Khanh (CERMAV-CNRS); Dr OGAWA, Yu (CERMAV-CNRS); CHOIS-NARD, Luc (DPM, Université Grenoble Alpes, CNRS); Prof. WOUESSIDJEWE, Denis (DPM, Université Grenoble Alpes, CNRS); PUTAUX, Jean-Luc (CERMAV-CNRS)

Presenter: Mr LE, Cong-Anh-Khanh (CERMAV-CNRS)