

Gelatinization of different starches in water by MICROCALVET

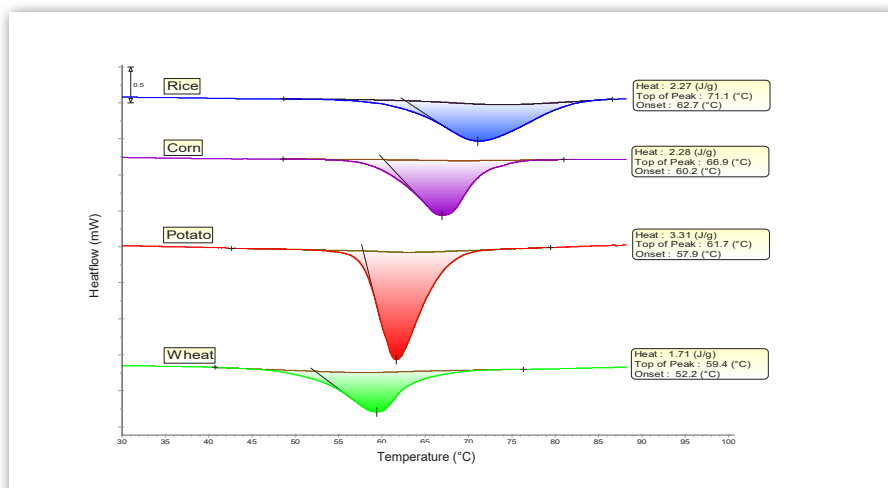
INTRODUCTION

Starch is a base product in food materials. It is especially true for rapid cooking, where it is used for its gelatinization properties. When starch grains are placed in contact with water and heated, an effect of gelatinization occurs at a well-defined temperature. This temperature depends on starch's botanic origin. In the present note, 4 starches (rice, corn, potato, wheat) are compared.

EXPERIMENT

Samples: Mixtures of different starches in water (25% starch by weight) :

- Atmosphere: air , atmospheric pressure
- Samples masses: about 325 mg of mixture in standard cells
- Heating profile
- 23°C to 90°C at 0.5 K/min
- Instrument: MICROCALVET



RESULTS AND CONCLUSION

An endothermic effect, corresponding to the formation of the gel network occurs around 60°C. The different samples have a range in the peak of the gelatinization effect of about 10°C. Wheat starch has the lowest temperature of gelatinization (59.4°C) and rice starch has the highest (71.1°C).

Rice and corn starches have similar heats of gelatinization. The maximum heat that is observed, corresponds to potato starch (3.31 J/g of mixture).

INSTRUMENT

MICROCALVET

-45°C to 120°C



HIGHEST HEAT MEASUREMENT ACCURACY

Calvet 3D sensor based on Peltier elements with Joule effect calibration.

MODIFIABLE TEMPERATURE CONDITIONS

for increased flexibility and replication of real life conditions.

CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS

to perform even the most demanding experiments using one instrument :

- high pressure (1000bar) and high vacuum
- pressure measurement and control
- mixing experiment

EXTERNAL COUPLING CAPABILITY

designed to increase your research options including manometry, BET instrumentation, gas analyzers, humidity controllers and gas panels