

Thermophysical Properties of Coffee as Affected by Processing

P. PITTIA, L. MANZOCCO, M. C. NICOLI

Dipartimento di Scienze degli Alimenti, Università degli Studi di Udine,
Via Marangoni 97, 33100, Udine, Italy. Tel: +39 0432590711, Fax: +39 0432590719

SUMMARY

It is well known the complex and dramatic changes, which take place in coffee beans during the roasting process, are associated to a wide number of heat-induced endothermic and exothermic reactions. Although differential scanning calorimetry (DSC) is frequently used for studying the thermophysical properties of food materials, until now few studies have been carried out on heat-treated foods such as coffee.

The aim of the present investigation was to study the thermal profile of coffee beans undergone the roasting process. The influence of preliminary technological operations such as decaffeination and/or defatting on the coffee thermal profile was also considered.

Different endothermic and exothermic phenomena were observed on coffee samples scanned in -120° - 400°C range in pans not hermetically sealed. These phenomena were attributed to lipid melting, water evaporation, and to the development of non enzymatic browning reactions and carbonisation. The relevant changes in specific heat (C_p) were also considered.

Results suggest that DSC technique can represent an interesting analytical tool for the characterization and analysis of different coffee varieties. In addition on the basis of the coffee thermophysical profile suitable indications for a better optimization of the roasting process could be obtained.