

When Are Coffee Beans just Right?

Development of Physico-chemical Properties During Roasting

C. FISCHER, H. K. CAMMENGA

Institute of Physical Chemistry, Technical University of Braunschweig,
D-38106 Braunschweig, Germany

SUMMARY

To gain a better insight into the details of the coffee roasting process, to facilitate its theoretical modelling and to improve its performance, basic physico-chemical properties of Arabica and Robusta coffee beans of different roasting degrees have been measured.

A large sample of Arabica Santos coffee beans was divided into seven equal fractions, each of which was separately roasted at 242°C for 40, 80, 110, 130, 150 and 200 seconds. A lot of Indian Robusta coffee beans was treated in a similar way. In this case, however, additional batches were prepared at 225, 250, 275 and 300 seconds roasting time. The difference between the two kinds of coffee beans as to the relative increase in size and dimensions was investigated.

Cleaved beans from different batches were inspected and photographed by Scanning Electron Microscopy (SEM); several interesting structures and features were observed to develop during roasting: bubbles/voids, deformation of inner structures and formation of Hecht filaments.

The colour of beans from each batch was quantified by their spectral remission and the data processed by computer. The development of colour during roasting and the differences between the two kinds of beans is discussed.