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Exploiting near infrared spectroscopy as an analytical tool for coffee roasting on-line monitoring

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Near infrared spectroscopy (NIRS) is an established analytical technology for in-line measurements in the agro-food industry due to the advantages of fast response time and absence of sample processing requirements [1]. It is especially useful to measure solid samples, in contrast with other analytical techniques which require sample processing such as preparation of liquid extracts. The aforementioned features of NIRS fit perfectly within the requirements of coffee roasters from a quality control point of view [2, 3]. Coffee roasters are concerned with green coffee quality, finding the best blend for consumer satisfaction and, finally, roasting control. Even considering that coffee roasters use typically green coffee from defined origins, they must account with the intrinsic heterogeneity of each green coffee batch. Green coffee as a natural product will present different characteristics related mainly with climacteric changes along the year. In this work, NIRS was used to monitor on-line a coffee roasting process using a diffuse reflectance probe. Batches of *arabica* and *robusta* species from different origins and variable roasting process conditions were monitored. One main characteristic of coffee organoleptic profile is acidity, which tends to increase during coffee roasting. Acidity profiles were estimated directly from NIR spectra showing an excellent agreement with values obtained with a reference analytical methodology.

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[2] M.C. Sarraguça et al., *Food Anal Met, 6 (2013) 892.*
[3] J.R. Santos et al., *Food Chem, 135 (2012) 1828.*

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