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Exploiting near infrared spectroscopy as an analytical tool for coffee roasting on-line monitoring. Application in the acidity determination

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The coffee roasting industry is particularly concerned about finding the best possible blend to ensure consumer satisfaction. Roasting is a technical skill which approaches an art form. It takes years of training to become an expert roaster with the ability to 'read' the beans and make decisions with split second timing. The need for a fine-tuned roasting control is therefore paramount [1]. 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, real-time on-line monitoring of the coffee roasting process was performed with near infrared spectroscopy (NIRS) using a diffuse reflectance probe. Batches of *arabica* and *robusta* species from different origins and variable roasting process conditions were assayed and monitored. One main characteristic of coffee organoleptic profile is acidity, which tends to increase during coffee roasting [2]. Spectral data were analysed with chemometric tools and acidity profiles were estimated directly from NIR spectra, revealing an encouraging agreement with values obtained with the reference analytical methodology. NIRS proved to be a reliable non-invasive technique for real-time monitoring of coffee roasting processes, revealing also good perspectives for the exploration of NIRS in the monitoring of other relevant compounds during coffee roasting.

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