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BOOK OF ABSTRACTS



OR14 - INSIGHT INTO SINGLE BEAN COFFEE AROMA WITH PTR-TOF-MS

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Coffee is one of the most consumed drinks in the world not only for its stimulatory effects but also due to its pleasing aroma which is a key element for quality evaluation and consumer acceptance. Coffee cup quality is affected by several combinations of factors: raw material related (green beans, the location where coffee beans grow, the variety, harvesting method, the conditions of growing location, handling conditions); roasting related (time-temperature profile, roast degree); single-origin or blend and the brewing technique. Roasting is one of the key steps for producing good cup quality therefore it is highly crucial to investigate the volatile compounds starting from the beginning of aroma formation at single bean level.

In this study we applied proton transfer reaction-time of flight-mass spectrometry (PTR-ToF-MS) as direct injection method for rapid analysis of coffee aroma released during offline of coffee beans from different geographical origins. A methodological approach was developed for offline headspace volatile profiling of individual coffee beans during different stages of roasting. Single beans were roasted at 190°C in a conventional oven up to 25 minutes by sampling every minute. After each time point (18 coffee beans x 26 time points = 468 coffee beans), the beans were cooled down and the volatile compounds were analyzed with PTR-ToF-MS.

Monitoring the volatile emissions of single-coffee beans gave an insight into the volatile formation at different stages of roasting and also its relation with raw material characteristics. The water content and the size of green beans strongly affected the volatile formation and the amount of volatile released. We observed a clear origin signature in the green beans. In conclusion, direct, fast and rapid volatile detection with PTR-ToF-MS allowed the aroma profiling of single coffee beans however a better approximation of industrial roasting (longer time, higher temperature,

tailored roasting apparatus) and wider sampling of different batches and origins are needed for in-depth understanding of aroma formation in coffee bean.

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