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HS-SPME-GC-MS fingerprints for the “identitation” of the coffee oxidized note

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RATIONALE

The quality of coffee is related to its flavour and aroma developed in chemical reactions during roasting [1]. During storage, coffee undergoes a series of chemical modifications influenced, among others, by temperature, moisture and oxygen, modifying the aromatic fraction and, thereby, its quality. These phenomena affect the shelf-life of roasted coffee, mostly depending on its form (ground or whole beans) and packaging, because of the fast oxidation of some components [2].

METHODS

HS-SPME-GC-MS combined with PCA was used to analyse roasted ground coffees undergone to an accelerate aging. Different packages: standard caps and soft pack for moka coffee were analysed to highlight aroma changes and to identify components related to the oxidation processes. The information resulting from the chemical HS-SPME-GC-MS fingerprints were compared to those of the sensory panel.

RESULTS

The trend over time of HS-SPME-GC-MS analyses goes towards an increase in volatile acids for the two coffee packages analyzed. With aging, PCA showed that moka samples and standard caps lost in quality of aromatic bouquet with a contemporary growing in acidity. Among the two packs, moka showed the highest amount of acids due to the extended superficial area available to the oxidative processes. These trends were also confirmed by the pH values of the brews. Results from the panel test showed an increase of off-flavor oxidized and acid notes in all coffees that prevailed in moka pack compared to caps.

CONCLUSIONS & PERSPECTIVES

These preliminary results show that the HS-SPME-GC-MS fingerprints combined with chemometrics is promising to study chemicals involved in the changes of coffee aroma during its shelf life. The chemical fingerprints affords to identify and define a “chemical identity” of the oxidized note in compliance with sensory evaluation.

References:

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