

Nonvolatile Compounds in Coffee

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SUMMARY

The major reactions involved with the taste, aroma and color of brewed coffee are considered to be caramelization, the Maillard reaction and the oxidative polymerisation of phenolics. These major reactions were reviewed.

Microorganisms were screened by their decolourising effect on such brown-colored foods and model compounds as caramel, melanoidin and polymerised phenolics. It is possible to categorize or distinguish the brown pigments formed in foods according to the decolouration rate by these microorganisms. The brown color in instant coffee could be categorized as pigments rich in phenolics, being selectively decolourised by *Peecilomyces verreauxii*.

For the interest in trace element nutrition Zn(II)-chelating compounds were separated from instant coffee by coagulating with ZnCl_2 and purified by chromatography in ion-exchange and cellulose columns, and the active compound was found to be a brown-colored polymer (m.w. 48000) of $-\log K_d = 8$ for Zn(II) with a yield of 0.3-0.4% from instant coffee. The chemical composition of the Zn(II)-chelating compound was found to be 30.4% phenolics, 3% sugar, and 4% amino acid. Alkali fusion gave 10% of such ether-soluble compounds as pyrogallol, protocatechuic acid, catechol, and *p*-hydroxybenzoic acid as the major phenolics. The formation of the active compound was monitored during the roasting process, and the chelating activity increased with increasing degree of roasting of the green beans. The chelating activity of brewed coffee was found to be greater in regular coffee than in instant coffee.