Reactions of nitrogenous compounds in coffee beans during roasting.

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ABSTRACT

During the roasting of coffee beans, lots of violent chemical reactions occur. The reactions include Maillard reaction, Strecker degradation, the degradation of sugars, lipids and amino acids and trigonelline. These reactions produce the special flavor of coffee. Experiments with various roasting temperature and time were conducted to investigate their effect on nitrogenous compounds reactions. In respect of basic components: the longer the roasting time, the lower the moisture content would be in the coffee beans . During the process of the experiment, the amount of crude fat would decrease with the increase of roasting time. The amount of protein and total soluble sugars of coffee beans become much lower after roasting. In the respect of nitrogenous compounds: During roasting, the amount of caffeine in coffee beans decreased with the increase of roasting time. The reason might be due to the separation of lecithins of choline of other purine alkaloids in coffee beans. The amount of trigonelline in coffee beans decreased with the increase of the roasting time and temperature. The reason might be the degradation of trigonelline during roasting. In the experiment, we found that the amount of nicotinic acid of green beans was very little. The amount of the nicotinic acid increased with the increase of roasting time. The reason might be the degradation of trigonelline during roasting. The degradation produces the compound, such as nicotinic acid. As for total free amino acids, large amount of amino acids decreased after roasting. It might be because that free amino acid takes great part in Maillard reaction during roasting. The results of this experiment showed that optimum roasting time for Colombia beans was 16 min when the roasting temperature was 230°C.

Keywords : nitrogenous ; caffeine ; trigonelline ; nicotinic acid

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