CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J0505

Project Title
To Press or Espress "O". That is Meletta Question

Abstract

Objectives/Goals
My objective is to determine the relative amount of caffeine in the various ways my parents make coffee in my house. They make coffee by using a Krups home espresso maker, Melitta filter, and coffee press. They use the same amount of coffee beams to brew cups with each method

Methods/Materials
Coffee samples (single cups of coffee each made with a 25g sample of ground beans) made from a Krupps Espresso maker, Melita drip, and coffee press, will have caffeine removed by extraction. The caffeine will be isolated and weighed. The extraction of each coffee sample will be accomplished with three Methylene Chloride washings in a separatory funnel. The methylene chloride washings will be filtered and then evaporated, leaving caffeine residue behind. The caffeine residue will be weighed by difference.

Results
The results of this experiment showed that coffee made with the Krups home espresso maker had the most caffeine compared to the Melitta Drip and Coffee Press.

Conclusions/Discussion
In my experiment the caffeine content was the highest in the espresso. The reason could have been for the higher temperatures of water (steam) used to brew the coffee.

Because I was analyzing for a very small amount of caffeine using a normal triple beam balance and glassware, my results could have had some errors. A more precise analytical balance would have been nice to have but it was not available at the time.

I extracted and purified the caffeine in each sample the exact same way but I had my doubts to whether or not the caffeine was as pure as I wanted it to be. Each sample had some impurities but I think the impurities were equal. That made my results meaningful as a comparison between the coffee making methods but not as a quantitative measurement of caffeine.

Summary Statement
My project is about determining the relative caffeine amounts in coffee made with an espresso maker, a Melitta drip, and a coffee Press.

Help Received
My parents helped me with the idea because they always debated on which method they make coffee had the most caffeine. A Eureka High School chemistry teacher, Mr. Benzinger, loaned me the entire chemistry lab supplies needed for this experiment. My father supervised the experiment.