



3rd
INTERNATIONAL WORKSHOP
ADVANCES IN CLEANER PRODUCTION

“CLEANER PRODUCTION INITIATIVES AND CHALLENGES FOR A SUSTAINABLE WORLD”

Extraction of Caffeine from the Husk of *Coffea arabica*

C. R. Cardoso^a, F. F. G. Telles^b, J. V. Nicolini^c, R. Santório^d, M. R. T. Halasz^e

a. DEQ / FAACZ, Espírito Santo, camillarc Cardoso@gmail.com

b. DEQ / FAACZ, Espírito Santo, jvnicolini@gmail.com

c. DEQ / FAACZ, Espírito Santo, fernandafumaneli17@yahoo.com.br

d. DEQ / FAACZ, Espírito Santo, santorio15@gmail.com

e. MPTA, FAACZ, Espírito Santo, halasz@fsjb.edu.br

Abstract

The high amount of waste generated in coffee stimulates studies of valorization ways of these. In order to make use of the coffee husk and decrease the generated environmental impacts in this activity, this study aims to define a caffeine extraction and purification methodology from *Coffea arabica* husk using dichloromethane as extractor solvent. The extraction of caffeine was performed using coffee husk roasted at 160 °C for a period of 5 minutes, by direct contact with agitation, indirect contact using Soxhlet and direct contact without agitation for 8 hours, resulting in 50% , 47% and 40% efficiencies respectively. Aiming to evaluate the direct contact with agitation method, the extraction efficiency behavior was determined according 1, 4 and 8 hours extraction times, obtaining 32%, 33% and 55% respectively, suggesting efficiency increase in over time. For the same method in order to analyze the extraction efficiency behavior according the husk/solvent ratio of 1:5, 1:10 and 1:20, getting 51%, 55% and 21,1% respectively, indicating an efficiency decrease according to husk/solvent ratio decrease. The caffeine extraction efficiency from this study was compared with some references data and these reviews can be seen that dichloromethane is another alternative of organic solvent to extract caffeine. In the caffeine purification was used a methodology in which the caffeine was treated with calcium oxide, activated coal and submitted to crystallization and adsorption process. The results showed that is possible to obtain an 99,95% efficiency and a 90,58% purity.

Keywords: coffee husk, caffeine, extraction, purification.

“CLEANER PRODUCTION INITIATIVES AND CHALLENGES FOR A SUSTAINABLE WORLD”

São Paulo – Brazil – May 18th-20th - 2011