

# The Evaluation of Caffeine Extraction by using Molecularly Imprinted Hydrogel-PVA

by Annisa Fillaeli, I Made Sukarna, Herlinda Meilianita

## ABSTRACT

This research aims at determining of Caffeine Imprinted Hydrogel-PVA (CIH-PVA) extraction capabilities to evaluate the ability of activated carbon extraction in the separation of caffeine. Extraction capability is determined based on calculations of how much caffeine is separated from the adsorption-desorption profiles.

The preparation procedures are done by solvent extraction, extraction with activated carbon and extraction with CIH-PVA. Solvent extractions are done by using chloroform, CCl<sub>4</sub>, n-hexane and diethyl ether. Extraction with activated carbon and CIH-PVA are done by batch through the interaction of a number of active carbon and CIH-PVA with a standard solution of caffeine and also done of optimization in advance, in terms of activated carbon mass and CIH-PVA optimum concentration of the standard solution, and the duration of optimum stirring time. Quantitation of the caffeine concentration was measured by UV-Vis spectrophotometer.

The maximum wavelength determination using a standard solution of 10 ppm caffeine solution showed maximum absorption at 272.5 nm. Standard solution in a concentration range of 1-11 ppm resulted linear equation of  $x + y = 0.05012 - 0.00444x$  with a correlation coefficient of 0.99. The percentage of extraction using chloroform, diethyl ether, CCl<sub>4</sub>, and n-hexane are 16.1%, 63.69%, 83.18% and 39.23% respectively, compared with the number of distribution (D) of 0.19, 1.75, 4.94 and 0.65 each solvent. The measurement results adsorption optimization achieved at a concentration of 250 ppm, a mass of 0.4 grams and a stirring time of 120 minutes. The results of desorption measurements showed the greatest release of caffeine in a 30-minute in the amount of 1.255 ppm.

Kata Kunci: *caffeine, extraction, CIH-PVA*