

Enhancement of Extraction Efficiency by Ultrasonic Waves

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Recently, ultrasonics has been applied for the intensification of extraction processing. The propagation and interaction of sound waves alters the physical and chemical properties of the materials that are subjected to ultrasonics. Ultrasonics has been suggested to disrupt plant cell walls thereby facilitating the release of extractable compounds and enhances mass transport of the solvent from the continuous phase into plant cells. Ultrasonics also exerts a mechanical effect, allowing greater penetration of solvent into the sample matrix, increasing the contact surface area between solid and liquid phase. In this work, 5g of the powders of the various soybeans containing isoflavones was dissolved in 100ml of an aqueous solution of 60% ethanol, and then the isoflavones were extracted by assistance of ultrasonics. The soybeans tested were from Chungsun. The purpose of this work was to prove the usefulness of the ultrasonics by comparing the amounts of the extracted isoflavones, (mainly daidzein and genistein). The experimental variables were ultrasonic frequencies (20 and 48 KHz) and the extraction times (10, 20, and 30). The analysis was performed using HPLC with the mobile phases of the binary system of water/acetonitrile/acetic acid.