ABSTRACT

CHARACTERIZATION OF COCRYSTAL *p*-METHOXYCINNAMIC ACID-CAFFEINE PREPARED BY SOLVENT EVAPORATION METHOD

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P-Methoxycinnamic acid as an anti-inflammatory by inhibiting cyclooxygenase enzyme thus disrupts the conversion of arachidonic acid to prostaglandin. APMS is porr solubility in water. This affects the bioavailability in the body giving nonoptimal effects. To improve its solubility, the formation of APMS with caffeine was carried out at a molar ratio 1:1 using the solvent evaporation method. Cocrystal is characterized by Differential Scanning Calorimetry (DSC), Powder X-Ray Difraction (PXRD), Scanning Electron Microscope (SEM), and Fourrier Transform Infrared (FTIR).

According to the thermograms, diffractograms, microphotographs, and IR spectra, APMS-caffeine cocrystal has different physicochemical characteristics compared to its physical mixture and raw materials. The DSC thermogram showed a decrease in the melting point of the physical mixture compared to its constituents. The melting point of a physical mixture of a 1:1 molar ratio is 155.09°C. Diffractogram of cocrystal showed new peaks at 2θ = 9.4054°; 13.8609°; 15.2124°; 17.8274°; and 19.2285°. Microphotograph of cocrystal showed a different habit forms with the two constituent materials, which have column crystal habits. The IR spectra in phusical mixture 1:1 showed loss of absorption bands in the O-H and C=O function groups of the APMS which indicates hydrogen bonding with caffeine.

Keywords*:* APMS, P-Methoxycinnamic acid, Caffeine, Cocrystal, Solvent Evaporation, Physicochemical Characterization.