

ABSTRACT

The Physicochemical Characterization of *p*-Methoxycinnamic Acid-Saccharin Cocrystal Made by Solvent Evaporation Method

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Para-methoxycinnamic acid (pMCA) is a substance from *Kaempferia galanga* L. pMCA has an analgesic effect, but it has a very low solubility in water (0,712 mg/mL). To increase the solubility of pMCA, cocrystal were mad. The aim of this study was to characterize the physicochemical characteristic of pMCA-saccharin cocrystal. The characterization process is done by Differential Scanning Calorimetry (DSC), Powder X-Ray Diffraction (PXRD), Fourier Transform Infrared (FTIR), and Scanning Electron Microscope (SEM). The cocrystal was made by solvent evaporation method with ethanol as the solvent. Compared to other pure components and physical mixture, cocrystal have some differences. The 1:1 cocrystal line thermogram shows an endothermic peak at 163,00°C. The cocrystal diffractogram 1:1 shows 5 new peaks of 2θ 20,68°; 24,20°; 29,66°; 33,07°; and 35,84° which were not found in the physical mixture. pMCA-saccharin cocrystal were formed if there is a hydrogen bond between a hydroxy group (O-H) and/or a carboxylic group (C=O) from pMCA with a sulphur oxide group (S=O) and/or N atoms in the pyridine ring of saccharin. Photomicrographs from cocrystal show different habit compares to the original component. Suggestions for further research is to create cocrystal with a molar ratio of 8:2; 7:3; and 6:4. The pMCA-saccharin cocrystal characterized using Single Crystal X-Ray Diffraction (SCXRD) to determine with certainty the bonds formed by intermolecular.

Keywords: *p*-methoxy cinnamic acid, saccharin, cocrystal, solvent evaporation, characterization