

ABSTRACT**The Effect of Water Concentration on Characteristics of *p*-Methoxycinnamic Acid-Saccharin Cocrystal Made by Microwave Radiation Method**

Shafira Dwita Anugrah

Para-Methoxycinnamic acid (pMCA) is a compound that has antinociceptive activity. Its low solubility in water affects bioavailability of the drug. Cocrystallization by saccharin as selected conformer, can increase the solubility of pMCA. The aim of this study was to determine the effect of water concentration on characteristics of pMCA-saccharin cocrystals made by microwave radiation. The molecule interaction can be increased by water when the sample is heated by microwave radiation. Characterization of the formed cocrystal was tested using Differential Scanning Calorimetry (DSC), Powder X-Ray Diffraction (PXRD), Fourier Transform Infrared (FTIR), and Scanning Electron Microscope (SEM). Compared to the constituent compounds, cocrystals are formed and there is a change in the physicochemical characteristics of the cocrystals. Cocrystal thermogram test of 0% w/w, 5% w/w, and 10% w/w showed an endothermic peak at 164.36°C, 164.26°C, and 163.78°C, respectively. PXRD diffractogram showed new diffractogram peaks: cocrystal 0% w/w at 2θ 20.66° and 24.25°, cocrystal 5% w/w at 2θ 20.68° and 24.23°, and cocrystal 10% w/w at 2θ 20.68°, 24.24° and 29.6°. The FTIR data showed some shifted peaks and also disappear. It was related with the hydrogen bond interaction between in the O-H group of pMCA, and the S=O group of saccharin. The SEM photomicrographs showed different crystal habits from the constituent compounds. In conclusion, cocrystal of pMCA and saccharin had been successfully formed and the water concentration affected the formation of cocrystal. Suggestions for further research should comprise cocrystal formation at different molar ratios and using Single Crystal X-Ray Diffraction (SCXRD) for characterization.

Keyword: *p*-methoxycinnamic acid, saccharin, cocrystal, microwave, characterization.