

**ABSTRACT****SOLUBILITY AND DISSOLUTION RATE PREDICTION OF p-METHOXY CINNAMIC ACID-CAFFEINE COCRYSTALLIZATION PREPARED BY SOLVENT EVAPORATION METHOD**

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p-methoxy cinnamic acid (pMCA) is an ester-type compound that works like NSAIDs (NonSteroidal Anti-Inflammatory Drugs). pMCA has anti-inflammatory, hepatoprotective, antidiabetic, antihyperglycemic, and analgesic activities. pMCA has 0.712 mg/mL solubility at 25°C, which means that it is very difficult to dissolve. Low solubility can affect to low bioavailability of pMCA. One of the methods that can be used to increase its solubility is the formation of cocrystal (cocrystallization). Cocrystallization requires cofomer that can form noncovalent bonds with pMCA. Caffeine has a carbonyl group which has the potential to form hydrogen bonds with carboxylate in pMCA. This study aims to determine the effect of the formation of pMCA-caffeine cocrystal prepared by solvent evaporation method with 1:1 ratio on the solubility and dissolution rate, through prediction from literature studies based on the characterization data that has been obtained. Characterization of cocrystal was performed using Differential Scanning Calorimetry (DSC), Powder X-Ray Diffraction (PXRD) and Scanning Electron Microscope (SEM). The results of characterization using DSC showed that the melting point of cocrystal (155.09°C) is lower than pMCA (173.55°C) and caffeine (235.86°C). Compounds with low melting point have low intermolecular interactions and higher solubility. Characterization with PXRD showed a decrease in crystal lattice energy which resulted in increased solubility. The results of microphotograph using SEM showed formation of crystals with new morphology, where different morphology will affect the solubility of the crystals.

**Keywords:** para-methoxy cinnamic acid, caffeine, cocrystal, solvent evaporation, solubility