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Characterization and Dissolution Test of Aspirin-Nicotinamide Cocrystal

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Abstract: Cocrystal becoming attractive as solid form to be developed. The formation of intermolecular bonds between active pharmaceutical ingredient (API) and coformer can change the physicochemical properties of an API without altering its pharmacological activity. The aims of this research to determine whether the formation of cocrystal with solvent-drop grinding method performed to increase dissolution rate of cocrystal and characterizationing of cocrystal. Cocrystals formation between aspirin-nicotinamide in equimolar ratio (1:2) have been prepared by solvent-drop grinding method. Cocrystalwas characterized by Infrared spectrophotometry (FTIR), *Differential Scanning Calorimetry and X-Ray Difractometry*(XRD), (SEM) *Scanning Electron Microscope* and dissolution test by basket method in artificial medium-gastric fluid acid. The result of dissolution rate showed that aspirin-nicotinamide cocrystal has increased in significant ($F=28.636 > F_t= 4$ and $\alpha=0.010$). The dissolution rate of cocrystal also showed the linearity of cocrystal dissolution ($R^2=0.9694$), and the rate was 0.5807 mg minute^{-1}t while single aspirin 0.4919 mg minute^{-1}. Based on the DSC and XRD analysis found that the typical peak shift indicates the formation of a mixed cocrystal. This is supported by the SEM microscopic observations, which reveal the shape of cocrystal produced. Hydrogen bond formation of aspirin-nicotinamide ratio (1:2) is heterosynthon between carboxylic and amide groups or between pyridine and carboxylate can be ascertained from the data analysis, infrared spectrophotometry.
Keywords : cocrystal, coformer, aspirin, solvent drop grinding.

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