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The Effect of Solid Dispersion Methods on the Dissolution Profile of Meloxicam

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Abstract : Solid dispersion is a homogeneous mixture of one or more active substances in an inverse matrix to get better dissolution and bioavailability from water insoluble active substances. Meloxicam as water insoluble inactive substances is used as a rheumatoid arthritis therapy, osteoarthritis from oxicam derivatives. As a Class II compound on a Biopharmaceutical Classification System (BCS) with low dissolution in digestive system. Solid dispersion of meloxicam is made of various methods and its applications (M1, M2, M3, M4, M5 and M6) using polymers PEG 6000 and PVP K30. Comparisons between polymer and meloxicam are 1:2 (F1), 1:4 (F2) and 1:8 (F3). The parameters used from dissolution profile are solubility (Q), the area under the curve (AUC) and dissolution efficiency (DE) which are measured on a 60 minute process of dissolution. Solid dispersion powder, physical mixtures and pure meloxicam are characterized by Fourier Transform Infra Red (FTIR), Differential Scanning Calorimetry (DSC) and X-ray diffraction.The results showed that of dissolution profile for each method and the best applications were M3F3 formula (Q = 103.90%; AUC = 2983.48; DE = 99.45%), M5F2 formula (Q = 98.14%; AUC = 2606.56; DE = 86.89%) and M6F3 formula (Q = 79.68%; AUC 2009.85; DE = 67.00%) Statistically, one-way ANOVA test showed that there were differences in the methods of dissolution profile of meloxicam and the applications of solid dispersion ($p < 0.05$). Therefore, it was concluded that from the method and applications of solid dispersion of meloxicam, formula M3F3 was the best method and the best application to improving the dissolution profile of meloxicam in a solid dispersion system.
Keywords: *Solid dispersion, PEG 6000, PVP K30, Meloxicam, Disolusi.*

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