Poster Presentation

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Evaluation of the polymorphism effects in the dissolution of Carvedilol tablets

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Polymorphism in solids is a common phenomenon in drugs, which occurs when an active pharmaceutical ingredient shows up in two or more crystalline forms. The polymorphism may influence the physical and chemical properties of pharmaceutical solids, particularly, solubility and dissolution rates which are very important properties because changes in these parameters may affect the absorption and consequently the bioavailability of drugs (especially those that have a low solubility). Carvedilol is an alpha and beta blocking agent that is used for the treatment of various cardiovascular disorders such as angina pectoris, congestive heart failure and hypertension. This work aims to prepare and characterize the forms II and III of Carvedilol drug and compare them in terms of solubility and dissolution rates. Carvedilol raw material was used as source of form II and Form III, and the last is a hemihydrate of Carvedilol that was obtained by a recrystallization process in ethanol/water 1:1 v/v. Both of the crystalline forms have been identified in this study by Powder X-Ray Diffraction experiments and attenuated total reflectance Fourier transform infrared spectroscopy studies demonstrated that the spectra of forms II and III of Carvedilol have no significant differences. The Thermal Analysis curves, as expected, allowed us to discriminate between the two forms due to a hydratation of Form III. In the solubility study, it was found that the polymorphic Form II is more soluble than Form III in certain conditions (pH 1.0 to 7.2). Dissolution studies have shown that polymorphism may influence the quality of Carvedilol tablets, since form III showed a higher drug release after 20 minutes of dissolution testing. Our results suggest that the identification of polymorphic phases should be a mandatory test for Carvedilol in an official compendium. Acknowledgments: We thank FAPEMIG, FINEP, CAPES and CNPq for their financial support.

[1] *O.M.M.SANTOS, M.E.D.REIS, J.T.JACON, M.E.S. LINO, J.S. SIMÕES, A.C.DORIGUETTO. Brazilian Journal of Pharmaceutical Sciences. 2014. Accepted.,* ***[2]*** *A.Y.LEE, D. ERDEMIR, A.S.MYERSON. Crystal polymorphism in chemical process development. Annu. Rev. Chem. Biomol. Eng., 2011,2, 259-80.,* ***[3]*** *D. SINGHAL, W. CURATOLO. Drug polymorphism and dosage form design: a practical perspective. Advanced Drug Delivery Reviews, 2004, 56, 335-347.*

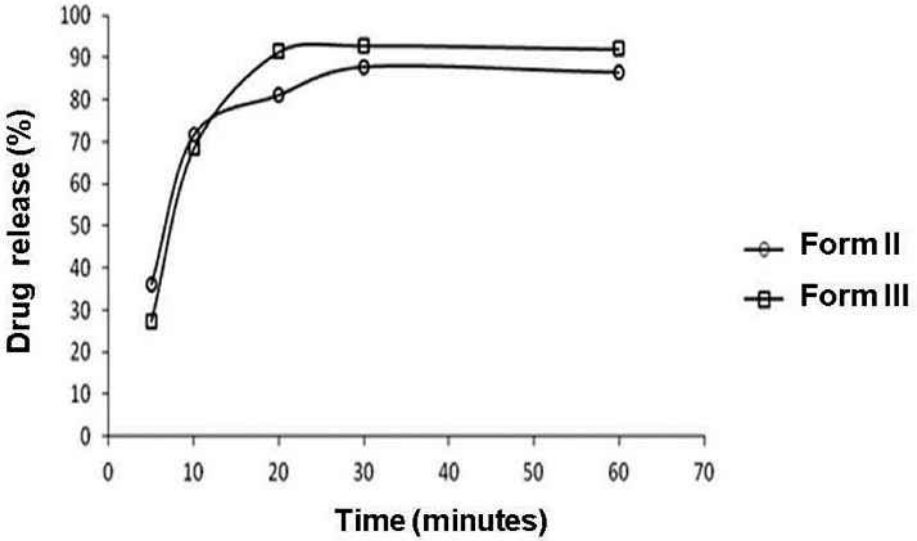

Fig. 1. Dissolution profiles of tablets containing Carvedilol Form II (raw material) And Form III (recrystallized).

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