Development of polymeric films incorporating amorphous drugs

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INTRODUCTION

Incorporation of amorphous drugs in formulations can help address current solubility challenges in drug delivery [1, 2]. The aim of the current study was to develop novel polymeric films for buccal drug delivery and to investigate their ability to incorporate and stabilize an amorphous drug.

MATERIALS AND METHODS

Film formulation. Aqueous gels containing carrageenan 911 (2.5%), poloxamer 407 (4%), PEG600 (5.5%) and ibuprofen (0.3% (w/w)) were dried in an oven at 60ºC for 24 hours to prepare the films. The films were analysed using DSC and XRPD.

RESULTS AND DISCUSSION

The DSC (Q2000, TA Instruments) results (Fig. 1) demonstrated the presence of amorphous ibuprofen (T_g= -45ºC) [3] within the film matrix and this was confirmed by XRPD (D8 Advance Bruker Instruments) (Fig. 2).

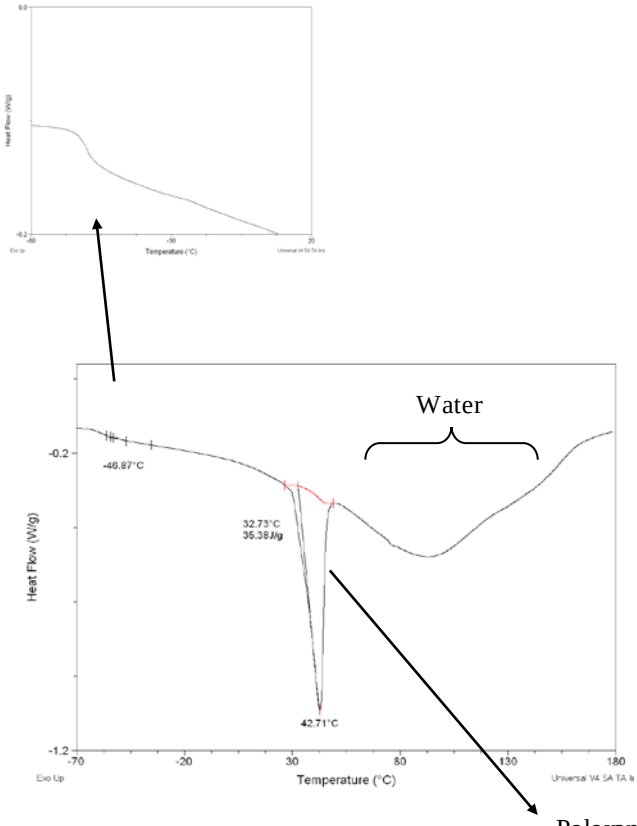

Fig.1. DSC results for film containing ibuprofen.

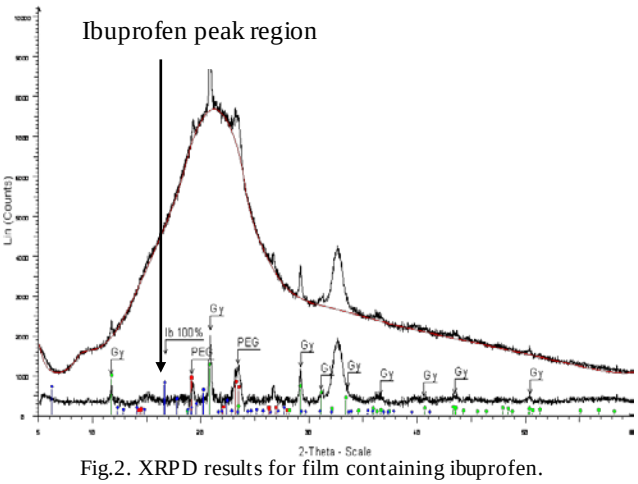

Fig.2. XRPD results for film containing ibuprofen.

The absence of the main peak for ibuprofen at about 16.2, 2-theta confirms the DSC results.

CONCLUSIONS

Buccal films incorporating ibuprofen in amorphous form have been developed and this was confirmed by DSC and XRPD techniques. Studies are ongoing to assess the stability of the formulation during storage.

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REFERENCES

[1] R. P. Dixit, and S. P. Puthil, "Oral strip technology: Overview and future potential". *J. Control. Release*, **139** (2009) 94-107.

[2] B. C. Hancock and M. Parks, "What is the true solubility advantage for amorphous pharmaceuticals?" *Pharm. Res.*, **17** (2000) 397-404.

[3] E. Dudognon, F. Danède, M. Descamps and N. Correia, "Evidence for a new crystalline phase of racemic ibuprofen." *Pharm. Res.*, **25** (2008) 2853-2858