Latin American Journal of Pharmacy
(formerly *Acta Farmacéutica Bonaerense)*
Lat. Am. J. Pharm. **29** (7): 1152-8 (2010)

Original Article
Received: November 18, 2009
Revised version: February 23, 2010
Accepted: March 3, 2010

Synthesis of Biodegradable Microspheres of Tramadol by Simple Phase Separation Technique and their *In Vitro* Evaluation

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SUMMARY. Biodegradable microspheres of Tramadol Hydrochloride (TmH) were developed using simple phase separation technique. Poly lactide-co-glycolide (PLGA) was employed as a release controlling polymer. Simple phase separation method was adopted to prepare microspheres; Dichloromethane (DCM) and Liquid Paraffin (LP) were employed as solvent and non-solvent respectively. Five kinetic models were applied to assess and describe the mechanism and pattern of TmH release from biodegradable microspheres. Biodegradable microspheres were subjected to FTIR, DSC and XRD, to evaluate TmH-PLGA interaction. Retardation in the release of TmH was observed as PLGA concentration was increased. Kinetics of drug release was following higuchi model. The microspheres exhibited no interaction between TmH and PLGA. Biodegradable microspheres of TmH can be produced using phase separation method. Microspheres were stable with no drug-polymer interaction. The accelerated stability studies also ensured the physicochemical integrity as differences of release profile over the period of three months were insignificant.

KEY WORDS: Biodegradable microspheres, *In vitro* evaluation, Non-solvent addition, PLGA.

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ISSN 0326-2383