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Formulation Optimization and Evaluation of Novel Injectable, Thermo Responsive and Cytocompatible Gel for Sustained Drug Delivery

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Abstract: The aim of the present work was formulation and evaluation of *in situ* gelling system of furosemide. Furosemide is a loop diuretic, which exhibits short half life, when given in the form of conventional injectable solutions. To overcome this, an attempt has been made to formulate temperature sensitive *in situ* gelling system of furosemide to provide sustained release of drug based on polymeric carriers that undergo sol-to-gel transition upon change in temperature. The furosemide *in situ* gelling system is formulated by using polyethylene oxide and carbopol 934P which acted as drug carrier and viscosity enhancing agent respectively. All the formulations were evaluated and the results of the study showed that 0.7% to 0.9% of polyethylene oxide produces consistent, maximum and sustained drug release. The formulations were clear liquid appropriate for injection of subcutaneous route. Gelation temperature all the formulations were found in between 32^0c-42^0c and gelation time varying from 2-5 minutes. pH was found to be around 7.4. Viscosity was found out which have rheological properties. The drug content of the prepared formulation was found to be within the range of 89-99.9%. The optimized formulation F4, F5 & F6 showed sustained drug release upto 13 hours.

Keywords: Injectable *in-situ*gel, thermo sensitive, sol-gel transition, sustained release.

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