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(57) Abstract :

**ABSTRACT** The present invention relates to a sustained release pharmaceutical formulation of Metformin Hydrochloride designed to provide controlled drug delivery over an extended period of twelve to twenty-four hours. The formulation comprises Metformin Hydrochloride as the active pharmaceutical ingredient in combination with hydrophilic polymers including Hydroxypropyl Methylcellulose and Sodium Carboxymethylcellulose, rate-controlling agents, and pharmaceutically acceptable excipients. The sustained release matrix tablets are prepared by direct compression method, ensuring uniform drug distribution and consistent release kinetics. The formulation exhibits zero-order release kinetics, maintaining therapeutic plasma concentrations while minimizing dosing frequency to once or twice daily. This invention addresses the limitations of immediate release formulations including short half-life, frequent dosing requirements, gastrointestinal side effects, and poor patient compliance. The sustained release formulation demonstrates improved bioavailability, reduced side effects, enhanced patient adherence, and superior glycemic control in diabetic patients compared to conventional formulations.

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