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Bilayer Floating Tablets: A Comprehensive Review of Design, Mechanism, and Future Prospects

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ABSTRACT

Gastro-retentive drug delivery systems, especially floating drug delivery systems, address the limitations of oral drug delivery by prolonging gastric residence time, thereby enhancing bioavailability, particularly for site-specific and locally acting drugs. Bilayer floating tablets utilize a gas-generating layer for buoyancy and a controlled-release layer for sustained drug delivery, improving absorption and patient compliance. Formulation involves gas-generating and swelling/bio adhesive approaches using various polymers and excipients. Manufacturing employs direct compression and layering, with emerging technologies offering enhanced control. Evaluation includes physical properties, floating behavior, drug release, quantification, stability, and in vivo tracking. Despite benefits like localized action and improved absorption, challenges such as dependence on gastric fluid and issues with different GRDDS types persist. Future efforts aim to overcome these limitations for optimized drug delivery.

Keywords: Bilayer floating effervescent tablets, gastro-retentive, immediate release, sustained release

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