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Box-Behnken Design and Molecular Docking Assisted Quenching Spectrofluorimetric Method for the Quantitation of Citalopram HBr in Commercial Dosage Forms

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Abstract

A simple, sensitive and accurate spectrofluorimetric method was presented for the determination of citalopram hydrobromide (CTM) in tablets. The method was based on the quenching of bovine serum albumin (BSA) fluorescence with CTM at pH 7.4. The fluorescence intensities were measured at 342 nm after excitation at 279 nm. Various factors affecting the quenching of BSA fluorescence

were optimized by response surface methodology (RSM) through Box-Behnken design (BBD. The plot of F_0/F versus CTM concentration was linear in the concentration range of 10–100 μg mL^{-1}. The limit of detection (LOD) and limit of quantitation (LOQ) were 2.08 and 6.30 μg mL^{-1}, respectively The molar combining ratio between CTM and BSA was 1:1. The complementary modified green analytical procedure index (ComplexMoGAPI) was 90%. The effect interference of common excipients found in tablets was investigated. Percent recoveries of CTM was ranged from 99.92 to 100.27% in tablets. © The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2025.

Author keywords

Box-Behnken design; Citalopram HBr; ComplexMoGAPI; Molecular docking; Quenching

Indexed keywords

Engineering controlled terms

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