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## Development and validation of HPTLC method for simultaneous estimation of Metformin Hydrochloride and Alogliptin Benzoate in bulk drugs and combined dosage forms

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A new, simple, precise, accurate and selective High Performance Thin-Layer Chromatographic (HPTLC) method has been developed and validated for the simultaneous estimation of Metformin Hydrochloride (MET) and Alogliptin Benzoate (ALG) in a tablet dosage form. Chromatographic separation was carried out on Merck HPTLC aluminium sheets of silica gel 60F254 using acetonitrile: 1% ammonium acetate in methanol (4.5:5.5 v/v) as mobile phase followed by densitometry analysis at 253 nm. The reliability of the method was assessed by evaluation of linearity (100-2500 ng/spot for metformin hydrochloride as well as for alogliptin benzoate). The accuracy of methods was assessed by recovery studies and was found to be within range of 98-102% for both alogliptin benzoate and metformin hydrochloride. The developed method was validated with respect to linearity, accuracy (recovery), and precision. The results were validated statistically as per ICH Q2 R1 guidelines and were found to be satisfactory. Due to non-availability of product, the simulation was done by using Glycomet\* tablets (metformin hydrochloride, 250 mg) and API of alogliptin benzoate. The proposed method was successfully applied for the determination of alogliptin benzoate and metformin hydrochloride in the mixture.

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## Cobalt(III) complex with morpholine and 2-acetylpyridine-based ligand: Synthesis, characterization, cytotoxicity, apoptosis induction and molecular modeling study

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A new N,N,'N" donor Schiff base ligand from the reaction of 4-(2-aminoethyl)morpholine, with 2-acetylpyridine in presence of sodium azide N3- ion was formed and coordinates with cobalt(II) ion giving rise to coordination complex of cobalt(III). The IR spectra were carried out in 4000–400 cm–1 range. The characteristic IR stretching frequency of the metal complex along with the proposed assignments are summarized in experimental part. The IR spectra of all the complex possess very strong characteristic absorption bands in the region of 1649–1661cm-1 which is attributed to the C=N stretching vibration of the Schiff base imino functional group. A chemical shift was observed at a region of 2070 and 2043 which is attributed to cobalt to azide metal bond. The spectra for the complex showed M–N bands at a lower wavelength in the range of 477-575 cm-1.The electronic spectra for all the complex was obtained in DMSO solvent and showed absorption band in three distinct regions. The first region ranging from 224 to approximately 280 nm ( $\pi \rightarrow \pi^*$ ) transitions, while the second characteristic wavelength in the region of 281 nm to approximately 409 nm ( $n \rightarrow \pi$ ) transition. The third distinct region ranging from 492 nm to approximately 606 nm is the (LMCT) from the nitrogen atom to the transition metal centre. MTT assay was used to determine the cobalt complexes cytotoxicity against human breast cancer cells MCF-7. Clonogenic assay confirmed the effectiveness of a specific agent on the survival and proliferation of the cells, apoptotic DNA fragmentation assay was done for a type of programmed cell death.

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