



Validated Spectrophotometric Methods for Simultaneous Estimation of Acetaminophen, Chlorpheniramine Maleate and Caffeine in Pure and Tablet Dosage Form

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SUMMARY. Two methods for simultaneous estimation of acetaminophen, chlorpheniramine maleate and caffeine in pure and tablet dosage form have been developed. Method I employs formation and solving of simultaneous equation using 246.4 nm, 264.4 nm, and 272 nm as the λ_{max} of acetaminophen, chlorpheniramine maleate and caffeine respectively in 0.1N HCl. Method II is a multi-component spectrophotometric analysis in which the instrument is preprogrammed to collect and compile the spectral data from the scan of standards and produces the result by matrix calculations. These methods are validated for accuracy, precision, linearity, specificity and sensitivity as per ICH norms. Validation studies are statistically significant. Calibration curves are linear over the concentration ranges of 5-50 $\mu\text{g/mL}$ for acetaminophen, 5-25 $\mu\text{g/mL}$ for both chlorpheniramine maleate and caffeine. High recovery reveals the reliability of the methods for quantitative study in tablet formulation. The methods are rapid, cost-effective and can be used as quality-control tool for routine quantitative analysis of acetaminophen, chlorpheniramine maleate and caffeine in pure and tablet dosage form.

KEY WORDS: Acetaminophen, Caffeine, Chlorpheniramine maleate, ICH guidelines, Multi-component method, Simultaneous equation method, Spectroscopy.

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