# Spectrophotometric Estimation of Acyclovir in Pharmaceutical Dosage Forms

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A simple, sensitive, rapid, accurate and precise spectrophotometric method has been developed for estimation of acyclovir in bulk and pharmaceutical dosage forms. Acyclovir shows maximum absorbance at 253 nm with molar absortivity of $1.3733 \times 10^4$ l/mol×cm Beer's law was obeyed in the concentration range of 2-20 µg/ml. Results of the analysis were validated statistically and by recovery studies.

Acyclovir, chemically known as 9-[(2-hydroxyethoxy)methyl] guanine is a purine nucleoside analogue, active against herpes simplex virus type 1 and 2 and against viricella zoster virus. It inhibits enzyme thymidine kinase and interferes with DNA synthesis[1]. It is official in USP and BP. The reported techniques for its estimation include solid phase extraction and HPLC[2] and electroimmunoassay[3] in serum and cerebrospinal fluid[4]. No spectrophotometric method is available for the estimation of drug in dosage forms.

The objective of the study was to develop simple, rapid, accurate and specific spectrophotometric method for the estimation of acyclovir using UV spectrophotometry. The simple method was developed using solvent distilled water with minimum processing steps. The $\lambda_{max}$ of acyclovir in distilled water was found to be 253 nm and Beer's law was obeyed in the range of 2-20 µg/ml. The result of analysis was validated statistically and by recovery studies, thus this method of estimation of acyclovir was found to be simple, precise and accurate.

A Shimadzu 1700 UV spectrophotometer with 1 cm matched couvettes was used for estimation. Standard solution of drug, 100 µg/ml was prepared in distilled water. Sample solution was prepared by weighing twenty tablets of acyclovir and powdered in glass mortar. Amount equivalent to 10 mg was transferred to 100 ml volumetric flask, dissolved, sonicated for 20 min and made up the volume with distilled water.

Aliquots of 0.2 to 2.0 ml portions of standard solution were transferred to a series of 10 ml corning test tubes and

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**TABLE 1: RESULTS OF ANALYSIS AND RECOVERY STUDIES**

| Formulations | Label claim (mg) | % estimated | SD | COV | SE | % recovery |
|---|---|---|---|---|---|---|
| Tab 1 Herpex | 400 | 100.8 | 1.32 | 1.31 | 0.76 | 99.3 |
| Tab 2 Acivir | 400 | 100.2 | 0.71 | 0.71 | 0.41 | 98.5 |
| Tab 3 Zovirax | 400 | 100.72 | 1.01 | 1.01 | 0.58 | 99.3 |

SD is standard deviation, SE is standard error and COV is coefficient of variation.

volume in each test tube was adjusted to 10 ml with distilled water. The absorbance of the solutions was measured at 253 nm against distilled water as a blank and calibration curve was constructed. Similarly absorbance of sample solution was measured and amount of acyclovir was determined by referring to the calibration curve. Recovery studies were carried out by adding a known quantity of pure drug to the pre-analyzed formulation and the proposed method was followed. From the amount of drug found, percentage recovery was calculated.

The proposed method of determination of acyclovir showed molar absorptivity of $1.3733\times10^4$ l/mol×cm and Sandell's sensitivity 0.01642 µg/cm$^2$/0.001-absorbance unit. Linear regression of absorbance on concentration gave the equation y=0.0609x+0.003 with a correlation coefficient of 0.9997. Relative standard deviation of 0.00134 was observed for analysis of five replicate samples, indicating precision and reproducibility.

Acyclovir exhibits its maximum absorption at 253 nm and obeyed Beer's law 2-20 µg/ml. The results of analysis and recovery studies are presented in the Table 1. The percentage recovery value 98-100% indicates that there is no interference from the excipients present in formulation. The developed method was found to be sensitive, accurate, precise and reproducible and can be used for the routine quality control analysis of acyclovir in bulk drug and formulations.

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