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DETERMINATION OF CLOFARABINE BY UV VISIBLE SPECTROPHOMETER AND INFRA RED SPECTROSCOPY

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ABSTRACT

HIV is a virus, when administered into the body it destroys T cells. HIV can be spread through Blood, Semen, vaginal and rectal fluids. Tenofovir is an anti-viral drug was determined by UV Visible Spectrophometer and Infra red Spectroscopy. For UV visible spectrophotometric study, Shimadzu 1800 double beam UV visible spectrophotometer, UV probes 2.33 was utilized. Tenofovir drug was identified by IR spectroscopy and also by Melting point determination and solubility.

Keywords: Tenofovir, UV Spectrophotometer, IR Spectroscopy, Determination

1. INTRODUCTION

Acute Lymphocytic Leukemia is cancer that affects the blood and bone marrow. The bone marrow makes white blood cells (WBC), red blood cells (RBC), and platelets **[1-3]**. WBCs help fight infection. RBCs help carry oxygen throughout the body. Platelets help the blood clot. ALL causes your body to make too many immature (young) white blood cells (WBC) **[4-6]**. These cells are cancer (leukemia) cells, and cannot fight

infection like healthy WBCs. Cancer cells crowd the bone marrow and prevent it from making healthy blood cells. Without enough healthy blood cells, you are at risk for infection, bleeding, and anemia. Anemia is a low level of red blood cells. Clofarabine (Chemically 5-(6-amino-2-chloro-purin-9-yl) -4-fluoro-2(hydroxymethyl)oxolan-3-ol**)** is a purine nucleoside antimetabolite that is being studied in the treatment of cancer **[7-13] (Figure 1)**.

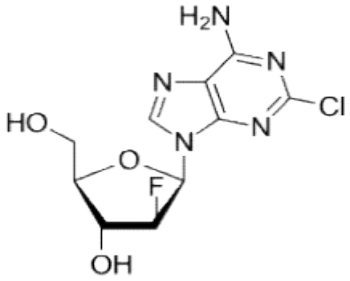

Figure 1: Structure of Clofarabine

2. CHEMICALS, REAGENTS AND INSTRUMENTATION

Standards and Reagents:

Standards, Reagents and instruments used in the study have been tabulated below in **Table 1-5**.

Table 1: Standard API Procurement

Standard	Source
Clofarabine	Yash Pharmaceuticals

Table 2: Sample Procurement

Sample	Source
Clolar infusion	Consilient Health Ltd

Table 3: Reagents Used In Experiment

Chemical/ Reagent	Grade	Manufacturer
Methanol	HPLC Grade	Finar
Water	HPLC Grade	Finar
Acetic Acid	AR	Spectrochem pvt Ltd.

Table 4: Instrumentation for UV spectrophotometer

Component	Brand / Model / Software
UV Visible spectrophotometer	Systronic 119

Table 5: Instrumentation for Melting Range

Component	Brand / Model / Software
Melting point Apparatus	Analab

3. EXPERIMENTAL AND RESULT

3.1 Identification of Drugs

3.1.1 Determination of Solubility

Determination of Solubility is shown in **Table 6**.

3.1.2 Determination of Melting Point:

Determination of melting point is shown in **Table 7**.

3.1.3 Identification by IR:

(A) IR spectra of Clofarabine

Figure 2 and Table 8 show the IR spectra of Clofarabine.

3.1.4 Selection of wavelength

The sensitivity of HPLC method that uses UV detection depends upon proper selection of detection wavelength. An ideal wavelength is the one that gives good response for the drugs that are to be detected. In the present study drug solutions of Clofarabine (20 µg/ml) was prepared in Methanol. This drug solution was than scanned in UV region of 200-400 nm and maximum Absorbance was recorded.

Clofarabine solution: 10 mg-→100ml with methanol. Further 1ml to a 10ml and make up with methanol (20 µg/ml in methanol). Solutions was scanned between 200 - 400 nm. Wavelength What Gives maximum Absorbance was selected from the Spectra **(Figure 3)**.

Table 6: Determination of Solubility

Drug	Solubility
Clofarabine	Soluble in methanol and water

Table 7: Melting Point of Clofarabine

Drug	Melting Point
Clofarabine	221-224^{0}C

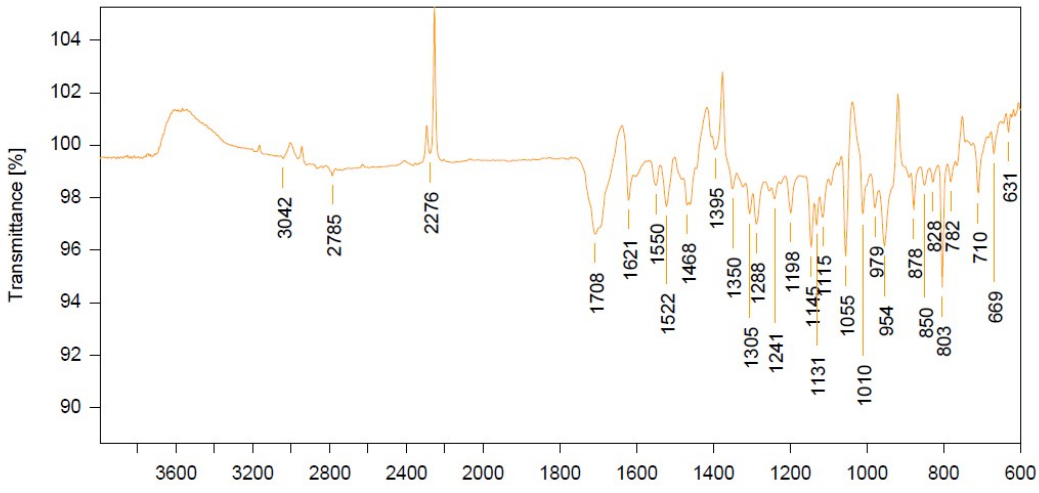

Figure 2: IR spectra of sample

Table 8: Interpretation of IR of Clofarabine

Frequency (cm^{-1})	Assignment
710	C-Cl (S)
1621	N-H (S)
1288	C-N (S)
2785	O-H (S)

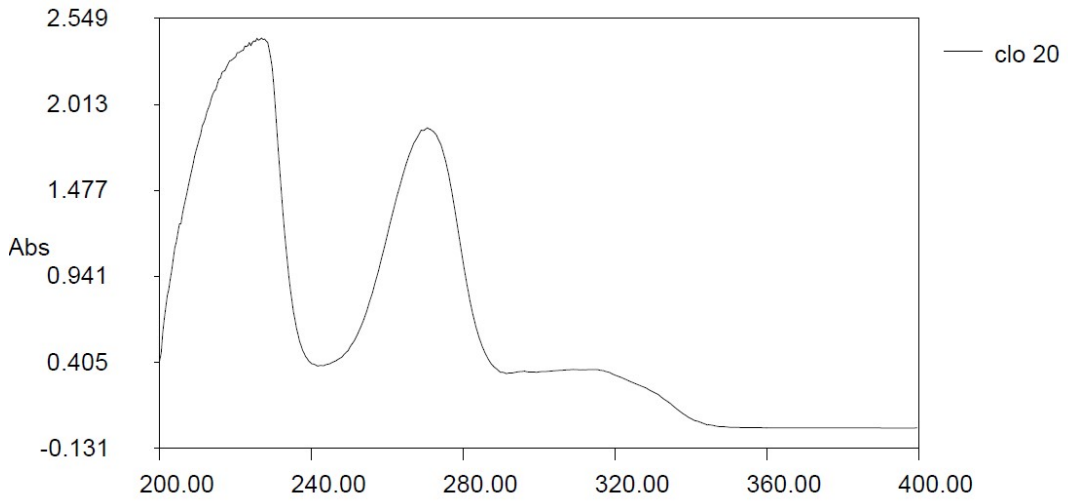

Figure 3: UV Spectra of Clofarabine (20 µg/ml) (Maximum Absorbance 254 nm)

4. CONCLUSION

Clofarabine is an Anti-neoplastic and anti-metabolite drug. Purpose of current research is to identify and determine the Clofarabine drug. Identification was carried out firstly by Infra-red spectroscopy, then determination of melting point and solubility of Clofarabine. Further, UV visible spectrophotometric study was carried out to optimise detection wavelength, which is beneficial for High performance liquid chromatographic study also. Hence, Clofarabine was scanned between 200-400 nm in UV Visible spectrophotometer.

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