A UV-Visible spectrophotometric method has been proposed for determination of Commercial Formulation of

Keywords: 1,10-Phenanthroline; Ferric chloride; Beer's Law; Accumulation; Heavy metals; Tomato; Flame atomic absorption spectrometer; Mu e furnace

Introduction

e biological chemicals that alter the growth of fungi are called fungicides. e decrease in crop production is the serious issue developed by fungi [1]. Fungicides are responsible to either spoil fungal cell membranes or it may interfere with energy production within fungal cells [2]. Fungicides can alter the nature of agriculture. Good quality crops are crucial for healthy life of human being. For the improvement of crop production researchers are investigating the fungicides of new formulations [3,4]. Difenoconazole is an active agent protecting plants, fruits and vegetables from fungal diseases.

e difenoconazole is a strobilurin fungicide and its chemical formula is (3-chloro-4-[(2RS,4RS;2RS,4SR)-4-methyl-2-(1H-1,2,4-triazol-1-methyl)-1,3-dioxolan-2-yl] phenyl4-chlorophenyl ether) [3-5]. Difenoconazole can cease the growth of fungi leaving healthy plant and its seeds [3,6-9]. Difenoconazole is safe from the environmental point of view. e fungicides lead to the inhibition of mitochondrial respiration in fungi either prevent the export of ATP, or the import of raw materials across the mitochondrial inner membrane and eventually destroying its activity [2,6,7]. e plants for which difenoconazole are more e ective are vegetables, rice, cereals, vines, fruits and ornamentals. Difenoconazole di uses directly through the leaf to vascular tissue and then through xylem and transported within the leaf [10-13]. Various studies have been carried out on difenoconazole using liquid chromatography coupled to tandem mass spectrometry with atmospheric pressure electrospray ionization (LC–ESI-MS/MS) [14,15], LC-MS/MS [16-19] and gel permeation chromatography-gas chromatography/mass spectrometry (GPC-GC/MS) [20]. Researchers all over the world are working on di erent aspects of this drug. As no research work has been done on spectrophotometric aspect of difenoconazole and the spectrophotometric technique is cheap and easily available technique. us, the present study is aimed to develop a simple, sensitive and cheap method for the analysis of difenoconazole in standards and commercial formulation.

Experimental

Materials and methods

Equipment: A UV/Visible spectrophotometer (Shimadzu, UV-1800, ENG 240 V) was used for analysis. e samples/standards were weighed using digital analytical balance (OHAUS Corporation USA).

Reagents: Analytical grade reagents were used in this study. Difenoconazole, 1,10-phenanthroline, ferric chloride, ethanol and methanolwere purchased from Sigma-Aldrich, Germany and BDH, England prepared sodium hydroxide was used. e commercially formulated difenoconazole contains 18.2% active ingredient.

Solutions:

Preparation of difenoconazole standard solution: A standard stock solution of difenoconazole (300 µg/100 mL) was prepared by dissolving 0.0003 g of difenoconazole in 20 mL methanol and diluted with methanol up to 100 mL.

Preparation of sodium hydroxide solution: Sodium hydroxide solution (5 mol/L) was prepared by dissolving 20 g in 20 mL of distilled water and diluted with distilled water up to 100 mL.

Preparation of ferric chloride solution: Ferric chloride solution (5%) was prepared by dissolving 5 g in 100 mL with methanol. In order to sustain all the iron atoms in ferric (III) oxidation state, 2-3 mL of concentrated sulphuric acid was added to the above solution.

Procedure: From the standard stock solution of difenoconazole (300 µg/mL) 3 mL was taken in a test tube followed by the addition

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July 17, 2018; July 28, 2018; July 31, 2018

Khan KA, Gulab H, Haider F (2018) Method Development for the Determination of Commercial Formulation of Difenoconazole Fungicide Using UV-Visible Spectrophotometer. J Anal Bioanal Tech 9: 410. doi: 10.4172/2155-9872.1000410

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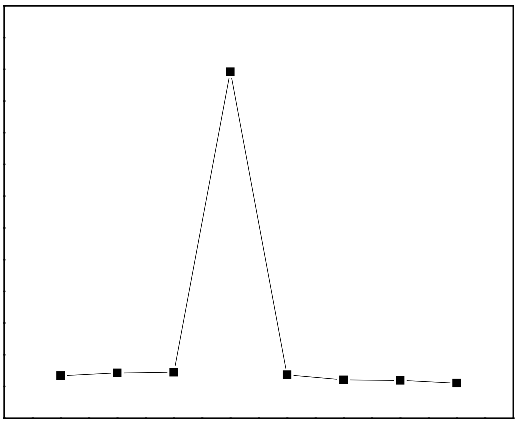
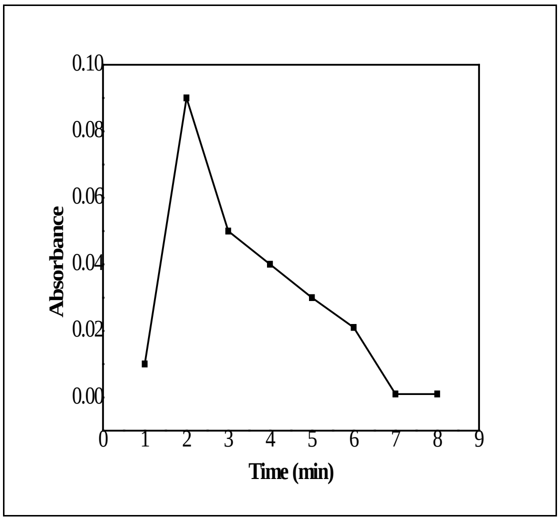
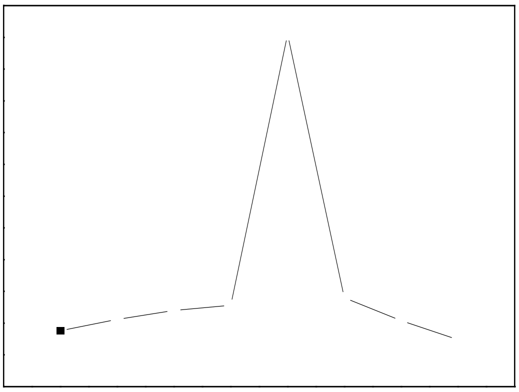
these solutions and plotted against volumes of $FeCl_3$

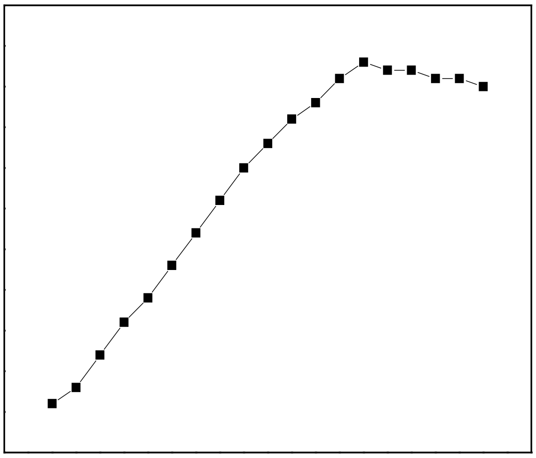


Effect of sodium hydroxide volume on the Iron-difenoconazole complex formation.



Effect of time on Iron-difenoconazole complex formation.





Verifcation of Beer-Lambert's Law.