JSS MAHAVIDYAPEETHA

JSS COLLEGE OF ARTS COMMERCE AND SCIENCE

(Autonomous, NAAC 'A' Grade and College with Potential for Excellence)

Ooty Road Mysore

Project / Dissertation / Internship Certificates 2022-23

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CERTIFICATE

It is to certify that **CHANDRALA RAMYA (UUCMS No. P01BE21S0392)** has submitted the project report entitled **"*Evaluation of antiadherence and prebiotic potentiality of bioactive polysaccharides extracted from Aegle marmelos (Bael) seeds*"** in partial fulfilment for the award of Degree of Master of Science (M.Sc.) in Biochemistry.

1/9/2023

Guide: Dr. M R Savitha Prashanth
Signature with date

Chairperson
Seal & Signature with date

Head of the Department
Postgraduate Department of Biochemistry
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1. 5/9/2023
Dr Jyothsna Kalanthy

2.

Dr. S Prathibha
Principal

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It is to certify that **Shravani A (UUCMS No. P01BE21S0262)** has submitted the project report entitled ***Studies on Keratin and Keratin hydrolysates from Chicken feather waste*** in partial fulfilment for the award of Degree of Master of Science (M.Sc) in Biochemistry.

Latha B.V 19/7/2023

Guide: **Dr. Latha B V**
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Uzm. Yasemin AĞAOĞLU
Head Of Congress Group

Sefa Salih BİLDİRİCİ
HEAD OF İSARC

Chemical Papers
https://doi.org/10.1007/s11696-022-02620-3

ORIGINAL PAPER

Use of smartphone for determination of flutamide in pharmaceuticals: capture on paper approach

C. Siddaraju[1,2] · B. Pallavi[1] · T. L. Pooja[1] · N. Rajendraprasad[1]

Received: 6 September 2022 / Accepted: 2 December 2022

Abstract

Two simple and inexpensive colorimetric captures on paper methods using PhotoMetrix PRO® Application of smartphone for the determination of flutamide (FA), an anti-prostate cancer drug, in pharmaceuticals are presented. The analytical procedure involves the conversion of FA to a free base form of flutamide by reduction, treatment with acetylacetone to obtain a Schiff base, and use of chromatographic paper to spot and capture the colored products of various analyte concentrations. Method-A is based on univariate vector RGB analysis to measure the color intensity of the Schiff base. Method-B on the other hand performed a multivariate partial least square analysis of the same Schiff base. Both methods showed a linear correlation over the range of 3–600 µg/ml reduced FA with respect to the measured intensity. For Method-A, the reported limit of detection and quantification are 0.75 µg/ml and 2.09 µg/ml, respectively. The regression coefficients are 0.986 and 1.000, respectively, for Method-A and B. The validation of the proposed methods was done concerning linearity, accuracy, precision, sensitivity, robustness, and ruggedness according to the current guidelines of ICH. The mean recovery of FA by Method-A (97.9 ± 2.04%) and Method-B (98.9 ± 1.65%) is comparable to the reference method (100.31 ± 0.406%). The accuracy and precision of the developed methods are confirmed by the calculated *t*- and *F*-values, which do not exceed the tabulated values at a confidence level of 95%. Thus, these methods can be successfully used as routine analytical methods for the quantification of FA in quality control laboratories.

Keywords Flutamide · Smart phone · Capture on paper · Photometrix PRO® · Determination · Pharmaceuticals

Introduction

Flutamide (FA) is familiar with the IUPAC name 2-Methyl-N-[4-nitro-3-(trifluoromethyl) phenyl] propanamide (Fig. 1). It is a nonsteroidal pure antiandrogen, and it is used in the treatment of prostate cancer (Budavari et al. 1989) and also polycystic ovarian syndrome (PCOS) (Eagleson et al. 2000). The active metabolite of FA, 2-hydroxy-flutamide was found to be mainly responsible for its antiandrogenic activity and acts by blocking and binding to intracellular androgen receptors in target tissues such as testis, prostate, skin, and hair follicles (Brogden et al. 1989; Adalatkhah et al. 2015; Paradisi et al. 2011).

In addition to the official liquid chromatographic method described in the European pharmacopeia (European Pharmacopeia 2005), there are several analytical techniques such as spectrophotometry (Deepakumari et al. 2012; Basavaiah et al. 2018; Nagaraja et al. 2002a,b; Rangappa et al. 2000; Ryan et al. 2003; Dr. Rao 2015), ESI–MS coupled with Soxhlet apparatus (Khan et al. 2015), HPLC, HPLC–DAD and HPTLC (Salgado et al. 2005; Smith et al. 2009; Abdelwahab et al. 2018; Jalalizadeh et al. 2006; Tevell et al. 2006; Esmaeilzadeh et al. 2016; Niopas et al. 2001), flow injection analysis (Tzanavaras et al. 2007), spectrofluorometry (Smith et al. 2008), stripping voltammetry, cyclic voltammetry, linear sweep voltammetry, differential pulse voltammetry and square-wave voltammetry (Hammam et al. 2004; Peckova et al. 2011; Afshan et al. 2020; Karthika et al. 2017; Svorc et al. 2017) and differential pulse polarography (Subba Reddy et al. 2011) have been used by researchers to quantify FA and its metabolites in pure form, in pharmaceuticals, and

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BrJAC

ARTICLE

Infrared and Electronic Spectroscopy for Assay of Dosulepin in Pharmaceuticals: *Stability Indicating Study and Quantification Approach*

Shivarampura M. Dushyantha[1], Chikkalingaiah Siddaraju[2], Nagaraju Rajendraprasad*[1]

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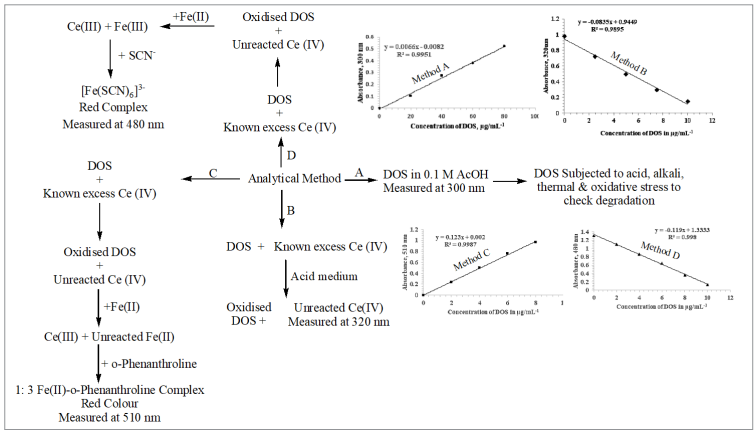

Four simple, precise, and cost-effective spectrophotometric methods were designed and validated to assess Dosulepin hydrochloride (DOS) in pure and dosage form. Two of them are direct UV (Methods A and B), and the other two are indirect visible spectrophotometric methods (Methods C and D). Method A is based on the measurement of the chromophoric activity of DOS in 0.1 M acetic acid (AcOH) at 300 nm. Method B involves the measurement of absorbance due to cerium (IV) left in excess after oxidizing DOS at 320 nm. The unreacted cerium (IV) was treated with a large excess of iron (II), which results in iron (III) and cerium (III). The surplus iron (II) forms a red colored complex with o-phenanthroline at a slightly higher pH was measured at 510 nm in Method C. In Method D the iron (III) formed in the redox reaction between unreacted cerium (IV) and iron (II) was made to form a red colour complex with thiocyanate and measured at 480 nm. The methods are applicable over good linear ranges of 1.0-80.0, 0.25-10.0, 0.5-8.0 and 0.50-10.0 µg mL^{-1} with actual molar absorptivity values of 2.07×10^3, 3.11×10^4, 4.08×10^4 and 3.7×10^4 L $mol^{-1}cm^{-1}$ for Method A, B, C and D, respectively. The validating parameters like limit of detection (LOD), quantification (LOQ), Sandell sensitivity and others have been reported. The methods proposed were successfully applied to quantify DOS in pharmaceuticals. The Fourier Transform Infrared (FT-IR) spectra of the post degradation DOS were studied, compared with that of pure drug and reached to the possible effect of degradation to stress by stability indicating property of Method A.

Keywords: Dosulepin hydrochloride, cerium (IV), spectrophotometry, chromophore, pharmaceuticals

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J. Water Environ. Nanotechnol., 9(1): 55-72 Winter 2024

ORIGINAL RESEARCH PAPER

Natural biodegradable low-cost Lablab purpureus husk as chromatrap for removal of three hazardous organic cationic dyes from water: Waste to wealth and column elution approach

Sumathi Harohally Paramesh[1], Veerendra Shetty Ananthpur[1], and Nagaraju Rajendraprasad[1]*

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ABSTRACT

Novel results in this study showcase the utilization of sunlight-dried, ground *Lablab purpureus* husk (LLPh), treated with water and alkali, as a highly efficient bio-adsorbent for the removal of cationic dyes from aqueous solutions. Methylene blue (MB), malachite green (MG), and crystal violet (CV) were effectively adsorbed onto NaOH-activated LLPh (NaOH-LLPh) as bio-adsorbent. Employing the Chromatrap method within a column, successfully removed these dyes, while the surface morphology of the bio-adsorbent was elucidated through scanning electron microscopy (SEM) analysis. FTIR spectrometric data revealed valuable insights into the extent of adsorption. The impact of factors including adsorbate concentration, adsorbent dose, pH, contact time, and flow rate on the adsorption process was systematically studied and optimized. Up to 1000 µg/mL of MB and MG and 50 µg/mL of CV were found to be effectively removed by adsorption at pH 4-5, 3, and 2, respectively, at the flow rate of 1 mL/min. The results of kinetic studies and adsorption isotherms of the above-mentioned dyes indicate that all three dyes follow the pseudo-second-order kinetics. The adsorption of MB and MG are well fitted with the Langmuir isotherm model. The other dye CV suits with the Freundlich isotherm model. Based on the results, NaOH-LLPh, as an inexpensive and eco-friendly adsorbent, is suitable for the removal of cationic organic dyes from aqueous samples.

Keywords: *Lablab Purpureus Husk, Chromatrap, Methylene Blue, Malachite Green, Crystal Violet, Scanning Electron Microscope.*

How to cite this article

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INTRODUCTION

Dyes are widely used to colorize the products in textile, leather, paper, wood, wool, pharmaceutical, cosmetic as well as in food industries [1, 2]. The effluents discharged straight into the water bodies from these industries are largely responsible for endangering aquatic life and creating carcinogenic effects. Long-term contact with dyes causes itching and irritation in humans; however, children are affected more quickly [3]. Thus, it is inevitable to make sure that industrial effluent is rendered less contaminated by removing harmful compounds by utilizing removal processes. Various techniques, including physical, chemical, and biological methods, can be employed to address significant contaminants such as organic compounds or dyes. The utilization of nanocatalysts [4-6], Fenton catalysts [7], and artificial neural networks [8] for eliminating these pollutants has gained increasing attention in research. Conversely, adsorption is on the rise in popularity due to its efficiency, environmental friendliness, and straightforward interpretability [9].

Methylene blue (MB), malachite green (MG) and crystal violet (CV) are familiar

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