



A.S.D. Government Degree College for Women

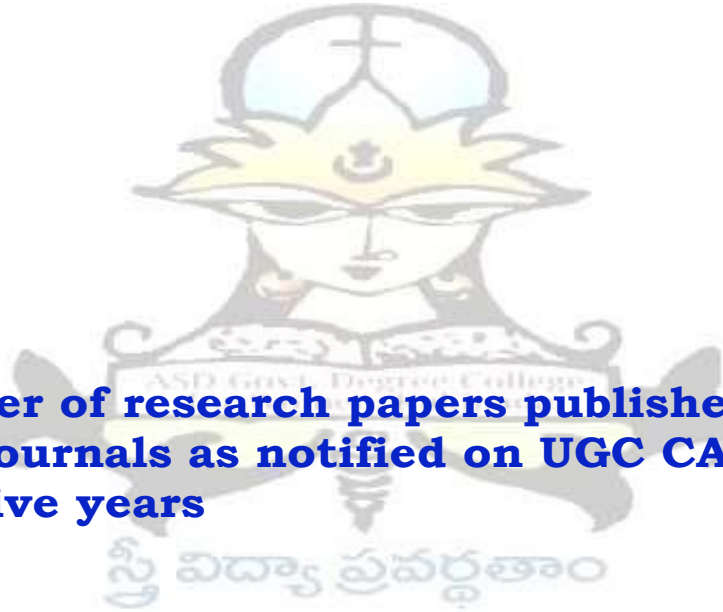
An Autonomous Institution

Jagannaickpur, Kakinada, Andhra Pradesh-533002

Affiliated to Adikavi Nannaya University, Rajamahendravaram



INTERNAL QUALITY ASSURANCE CELL



3.4.3 Number of research papers published per teacher in the Journals as notified on UGC CARE list during the last five years

**NUMBER OF RESEARCH PAPERS
PUBLISHED
(2020-2021)**

3.4.3 Number of research papers published per teacher in 2020-2021

S.No	Title of paper	Name of the author/s	Department of the teacher	Name of journal
1	Bhagavathgithalo manava jiveethadrashamulu ,Viluvalu	K.Madhavi	Telugu	International Journal of Multidisciplinary Educational research
2	Determination of Lisinopril in Bulk and Pharmaceutical Formulations by Cloud Point Extraction-A Green Method	V. Mallikarjuna Sharma	Chemistry	American Journal of Analytical Chemistry
3	Nanocobalt oxide for the adsorption of rare earth elements {La(iii) & Nd(iii)} - adsorption isotherms and kinetics	Vadivelu Anantha Lakshmi	Chemistry	Sambodhi(UGC Care Journal)
4	Women portrayals in fine clothes to the jew	Y. Swarna Sri	English	Internatioanl Journal of Multidisciplinary Advanced Research trends (IJMART)
5	The Sabalern Can Speak in the Select Works of Bama	Y. Swarna Sri	English	Internatioanl Journal of Multidisciplinary Advanced Research trends (IJMART)

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శ్రీగురుభ్యోనమః
 భగవద్గీతలో మానవ జీవితావర్తములు, విలువలు

- శ్లో|| పాఠ్యాదు ప్రతిదోషితాం భగవతా చామృతేషు స్వదుష్టేషు
 వ్యాసేన భ్రష్టితా పుణా ముహూనా మక్యే మహాభారతమ్||
- శ్లో|| అలైతామృత పర్వీణీం భగవతీం అష్టాశ్వాత్యామీమ్||
 అంబ! త్వా మనుసుందరాది భగవద్గీత! భవద్దేవీమ్||

భారతీయ సంస్కృతీ సంప్రదాయ చైతన్యాలకు అభారవైది వేద పూజేతిహాసములు. వేద వ్యాసుని చేత రచించిన మహాభారతమును ముఖ్య పేదం. భారతాంతర్గతమైన భగవద్గీత మహాభారతము యొక్క సమగ్ర సాంకేతికం. వేద సారముగా భగవద్గీత యందు విస్తృత యుద్ధ మహాభారతము అలాగే భగవద్గీతకు తెలుగులో అనేకమైన అనువాదాలు, వ్యాఖ్యానాలు ఉన్నాయి. వాటిలో ప్రసిద్ధమైన అనువాదము కవిత్వము రచించిన భగవద్గీత టీపు పర్వములో భగవద్గీతను మహాభారత తిక్కన వివరంగా కాక చాలా సంగ్రహముగా కొన్ని గర్భ పర్వములో వ్యాఖ్య రచించిన భగవద్గీతకు తెలుగులో శ్రీమాన్ దావరధి రంగాచార్య గారు విశేషాభి ప్రతిపాదకంగా కూర్చారు. 'గీత కర్తవ్యవ్రతు' అనే పేరుతో శ్రీ పద్మనాభ రాజగోపాలాచార్య "నిర్వృతీవిరంలో భగవద్గీత" అనే పేరుతో సరళమైన తెలుగులో గీతను వెలువరించారు. భగవద్గీతలో అధ్యాత్మిక, పాపకర్మక విషయాలను గూడ వాటిలో పాటు నేటి సామాజికులకు అవసరమైన, సామాన్యులు నిర్వృతీవిరంలో అనుసరించవలసిన విశేషములన్ని ఉన్నాయి. పర్వ భాగంలో చెప్పాలంటే భారతీయార్య భగవద్గీత యందు పుస్తకమువలె ఉంది.

పాండవులకు, కౌరవులకు యుద్ధము అనిచార్యవైదివ్రతులు అర్జునుడు మకు నైర్వృతములోని యుద్ధపుణ్య, గురువులకు చూసి తన తన సారధి యైన శ్రీకృష్ణునితో - నాకు విజయము గానీ, రాజ్య సుఖములు గానీ పంపి' అని రుద్రాక్షమును మరచి పాపములను మరచి విషయములను అర్జునునికి అభ్యాసమును పోగొట్టి, వివేకమును కలిగించడానికి చేసిన కర్తవ్యపరీక్షను గీత. శ్రీకృష్ణ భగవానుని చేత చెప్పబడిన అన్ని భగవద్గీత అయినది. నిరాశ కన్యకలవైదువు, మనసు నిండా భయము అపరిచింపబడుతుంది ఏమి చేమాలో అర్జునుడు మంచి నైర్వృతమును చూసి నైర్వృతము పోగొడుతుంది. మనమీద మనకు నమ్మకం కలిగిస్తుంది. కర్తవ్యమును ఉపసేవీస్తుంది. వ్యర్థమైన వీరి సూత్రములను వివేకవృత్తి వల్ల పరి వివేకము, వివిది నిజమైన జ్ఞానమో సాధించాలంటే నిరూపిస్తుంది. అభ్యాసములో మునిగి ఉన్న మానవునికి స్వస్వభావ జ్ఞానమును చెప్పింది. జ్ఞానంకోసం, దుర్భాషాసాలతో కర్తవ్యమును విస్మరించి ప్రవర్తించే నేటి యువకులకు సరియైన దాని చూపిస్తుంది. వాల్మీకి ప్రవృత్త కాండలో గీత యొక్క అవసరం చాలా ఉంది. గీత సర్వ దేశ, సర్వ రాజ్యాస్యాయి. ఈ ప్రపంచంలో మానవుడు జీవించి ఉన్నంత వరకు మనకి జీవించి వెదక చూపి అభ్యాసమైన తేజస్సు భగవద్గీత. భగవద్గీతలో ఏమి ఉందో ప్రతి ఒక్కరూ స్వయంగా పురిచింది కర్మక తెలుసుకోవాలి. వేది కానానీ, నూనానీ, నూనానీ అన్ని వర్గాల ప్రజలకి భగవద్గీత అవశ్య పరిచియైన గ్రంథం.

నేటి కాలంలో అధ్యాత్మిక రంగంలో భక్తి అంటే తప్పక, కావాలి అనే భజన అనీ, గురుభ్యో గోపూణ సుమ్యస్తా చేసి త్వ దాత అనీ. ద్వాన యోగముంటే ముక్కు మూసుకొని తప్పని చేరుట అనీ, జ్ఞానముంటే అనేక గ్రంథాలను కుంభం చేయుట అనీ, మూడు అంటే దాహియించారవరణం అనీ వివేక మంచి యిక్క అభిప్రాయం. వానీ సత్య వాచు, రుద్రాక్షమైనను. నేను చుక్కన గ్రీష్మ, కలిమిలో కొన జీవనమే భక్తి సర్వ భూతములు తన పంది వాకే అను భావమే జ్ఞానము. భాగ విరాసములను వర్ణించుటే త్యాగము. మించుట జీవన సన్యాసము అని భగవద్గీత చదివిన వారికి తెలుస్తుంది.²

- 'గీ' అనగా గానము చేయువారిని
- 'త' అనగా తరింపజేయునది.

వివిధంగా తరింప జేస్తుంది?

అర్జునుని వలె విషాదములో మునిగి కర్తవ్యకా విముఖులైనవ్రతులు వారికి సాంఖ్యమును (విడి కాను, విడి కాను కాదు అనే తెలివి), నిర్వృతము కర్మను (పని) చేయుటం, నిజమైన జ్ఞానము, నత్యూచరణము, అత్య విగ్రహము కలిగి ఉంటుంది పండి విషయములను తెలివి చెప్పి వినియోగములు వాటిలో కొన్నింటిని పురిచిరిద్దాం :

1. వైర్వము : -

భగవద్గీతలో శ్రీకృష్ణుడు అర్జునును మొదటగా హృదయ దౌర్బల్యమును చదివి కర్తవ్య విషయం చెప్పి దోషించాడు. "ఓ అర్జునా! అలైర్వమును పొందవద్దు. నిర్వృత్యులను కావద్దు. వీలమైన హృదయ దౌర్బల్యమును పాశ్చాత్య కర్తవ్యమును వ్యవహరించుట దోషం" అంటాడు శ్రీకృష్ణుడు. ఇక్కడ శ్రీకృష్ణుడు అర్జునుని యుద్ధమునకు ప్రోత్సహిస్తున్నాడని భ్రమ వరకూరడు. ఎందుకంటే అర్జునుడు క్షుణ్ణమును కాక సంపాదన చేయుట, రాజ్య రక్షణ చేయుట క్షుణ్ణముల కర్తవ్యములు. అందుచేత అర్జునునికి తన కర్తవ్యమును గుర్తు చేశారు. వ్యవధి దౌర్బల్యం శారీరక దౌర్బల్యం కన్నా క్షుణ్ణమైనది. విజికి వాళ్ళు ఏమీ పాధించలేరు. వీలమైనది. మిటే గీత యొక్క మూ సుతీయము వివేకము పేర్కొన్నారు. ద్వాన విరచితమైన సంస్కృత భారతంలో దీనికి అభారవైది వ్రాశాం :

"కైన్యం మాస్యగమః పాల్మీ వైత త్రయ్యనపర్వతే
 క్షుద్రం హృదయ దౌర్బల్యం త్యక్తైర్వైష్ణవరంకమ"³

Determination of Lisinopril in Bulk and Pharmaceutical Formulations by Cloud Point Extraction—A Green Method

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Abstract

A sensitive and eco-friendly method was developed for the spectrophotometric determination of Lisinopril (LSP) in bulk and pharmaceutical formulations by cloud point extraction technique. The method was based on the formation of a blue-colored coordination complex between Lisinopril (LSP) and Cobalt Thiocyanate (CTC) at a suitable pH. The Complex in aqueous medium was extracted into surfactant layer by cloud point extraction using a non-ionic surfactant Triton X-114 and then the surfactant layer was dissolved in a suitable volume of ethanol and the amount of Lisinopril was determined spectrophotometrically at a wavelength of 625 nm. The conditions like concentration of the drug, concentration of CTC and of Triton X-114, P^H, etc. were optimized by OFAT (One Factor At a Time) method. The linear range of calibration curve was 1 - 6 µg/ml and the linear regression equation with a correlation coefficient of 0.99996 was $y = 0.0021 + 0.084x$. Preconcentration and enrichment factors were found to be 100 and 3.12 respectively, achieving the detection limit of 0.0588 µg/ml. The proposed method was successfully applied for the determination of LSP in the drug formulations. The obtained values were in agreement with the values as quoted by the manufacturers.

Keywords

Lisinopril (LSP), Cobalt Thiocyanate (CTC), Coordination Complex Formation, Cloud Pint Extraction (CPE), Spectrophotometry

1. Introduction

For the body's production of angiotensin II, Angiotensin converting enzyme inhibitors (ACE inhibitors) drugs are applied. It is a hormone that circulates and

constricts blood vessels and has many effects on the cardiovascular system and sometimes causes heart attack or heart failure. Blocking production of angiotensin II with ACE inhibitors prevents constriction of blood vessels, lowers blood pressure, and weakens the energy the heart has to expend from beat to beat [1]. Lisinopril (LSP) is a drug of angiotensin converting enzyme inhibitors class used primarily in the treatment of high blood pressure and heart failures and after heart attacks. Lisinopril is chemically known as 1-{N²-[(1S)-1-Carboxy 3-Phenyl Propyl]-L-Lysyl} L-Proline [2] and the structure is shown in **Figure 1**.

Few methods reported so far includes spectrofluorimetric methods [3] [4] [5], polarographic method [6], high performance liquid chromatography (HPLC) [7], liquid chromatography-mass spectrometry (LC-MS) [8], UV spectroscopy [9], and spectrophotometry [10]-[17]. Determination of drugs by spectrophotometry using Cobalt Thiocyanate (CTC) [18]-[23] was carried out by extracting the drug-CTC complex into an organic solvent like nitrobenzene which is a toxic solvent. Hence a sensitive, low-cost and green method was developed for the spectrophotometric determination of Lisinopril using CTC by cloud point extraction technique. Moreover, there are a few reports available for the determination of drugs by CPE coupled with spectrophotometry [24] [25], spectrofluorometry and RP-HPLC [26] [27] [28] [29] [30]. In the present work, a new, sensitive and green method was developed for the determination of Lisinopril in bulk and pharmaceutical formulations by CPE in combination with UV-Vis spectrophotometry. The method was based on the formation of coordination complex between LSP and CTC at a suitable pH followed the extraction of the complex by cloud point extraction using Triton X-114 under the optimum conditions. The extracted surfactant layer was dissolved in a little volume of ethanol and the drug was determined by UV-Vis spectrophotometry at λ_{\max} of 625 nm. The proposed method was applied for the determination of LSP in pharmaceutical formulations.

2. Materials and Method

2.1. Instrumentation

The absorption spectra and absorbance values of the selected drug were scanned by using a Systronics-119 double-beam UV-Vis Spectrophotometer with 10-mm superior quality quartz cuvettes. Thermostatic water bath (SISCO, Maharashtra,

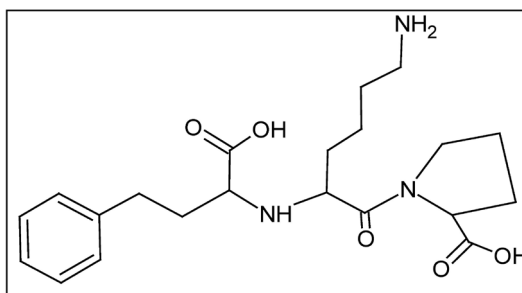


Figure 1. Structure of Lisinopril.

India), Microprocessor based Laboratory Centrifuge (Laby, India) were used for CPE procedure. For calibrating the pH measurements of solutions, digital pH-meter (Analab, India) was used.

2.2. Reagents and Materials

A. R. grade chemicals were used in the present work. An aqueous solution 0.5 M of Triton X-114 (obtained from Sigma Aldrich, India) was prepared by dissolving 25.4 ml of Triton X-114 in distilled water to get a final volume of 100 ml solution. A pure grade LSP was supplied by Dr. Reddy's Laboratories, Hyderabad, India. A stock solution of 1 mg/ml of LSP was prepared by dissolving 100 mg of the drug in distilled water and made up to 100 ml. A working solution of 100 µg/ml was further prepared for analysis. A stock solution of CTC (2.5×10^{-1} M) was prepared by dissolving 7.25 g of cobalt nitrate and 3.8 g of ammonium thiocyanate in 100 ml of distilled water. Buffer solutions of pH ranging from 2 to 10 were prepared and calibrated with a digital pH meter.

2.3. General Procedure for CPE

Aliquot of working standard solution of LSP was transferred into a 15 ml graduated centrifuge tube and 3.0 ml of CTC, 1.0 ml of buffer (pH = 2.0) and 1.0 ml of 0.5 M Triton X-114 were added and diluted with distilled water up to 10 ml. The solution was shaken thoroughly and then kept for 30 min in the thermostatic bath at 40°C. The separation of the phases was further carried out by centrifugation at 4000 rpm for 8 min. The phases were cooled down in an ice water bath for 10 minutes. The layers were separated by inverting the tube. The surfactant-rich layer containing the complex was dissolved with suitable volume of ethanol and the absorbance of the complex measured at 625 nm against a reagent blank prepared under similar conditions.

2.4. Procedure for the Tablets

Four tablets of Listril (Manufactured by Torrent Pharmaceuticals Ltd., India) each containing 2.5 milligrams of LSP were initially crushed, powdered, weighed out and the average weight of one tablet was determined. An accurate weight equivalent to 2.5 mg of LSP was dissolved in 25 ml distilled water and then filtered. Aliquot of this solution was taken within the calibration range and then analyzed as described under the general procedure. The drug content of the tablet was assayed from the calibration curve.

3. Results and Discussion

3.1. Absorption Spectra

The absorption spectrum of LSP-CTC Complex after cloud point extraction with Triton X-114 was scanned between 500 and 800 nm. The blue colored complex shows that the absorption maximum at λ_{\max} of 625 nm in visible region as shown

in **Figure 2**. Thus the wavelength of maximum absorbance at 625 nm was chosen for the present study.

3.2. Optimization of Parameters that Affect CPE

All the important factors that affect the CPE efficiency of the drug LSP were sequentially investigated by OVAT method via changing one factor while keeping other factors constant. In this respect, the effect of pH, concentration of CTC, of non-ionic surfactant Triton X-114, temperature and centrifugation speed and time were optimized.

3.3. Effect of CTC Concentration

The effect of concentration of CTC on the absorbance of LSP-CTC complex in the presence of Triton X-114 was studied by recording the absorbance of the complex at λ_{max} (625 nm) over the range of 1.0 - 6.0 ml of CTC (2.5×10^{-1} M) while keeping the concentrations of LSP, buffer (pH = 2.0) and Triton X-114 constant. The results showed that the absorbance of complex in the surfactant layer increased as shown in **Figure 3** with increasing CTC concentration with subsequent increase of absorbance in the aqueous layer also. It indicates that the CTC itself interferes with the absorbance of the complex as its concentration increases in the aqueous layer. 3.0 ml of CTC (2.5×10^{-1} M) was selected as its optimum concentration.

3.4. Effect of pH

In order to study the effect of pH on the extraction efficiency of the complex, the solutions containing LSP, CTC, and Triton X-114 were subjected to cloud point extraction by varying the pH of the solutions in the range of 2 - 10. The study showed that the absorbance and extraction efficiency of the complex decreased as shown in **Figure 4** from pH 2.0 to pH 7.0 and then increased from pH 7.0 to pH 10.0. Since maximum efficiency was achieved at pH 2.0, this pH was selected for CPE procedure.

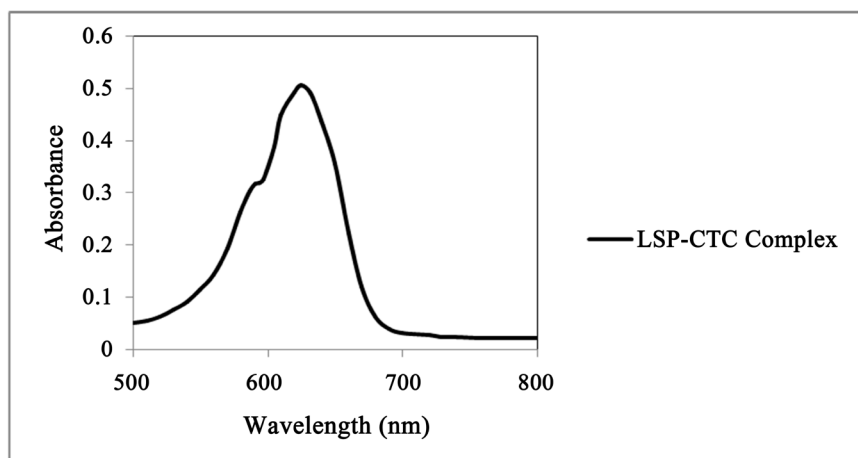


Figure 2. Absorption spectra of LSP-CTC complex.

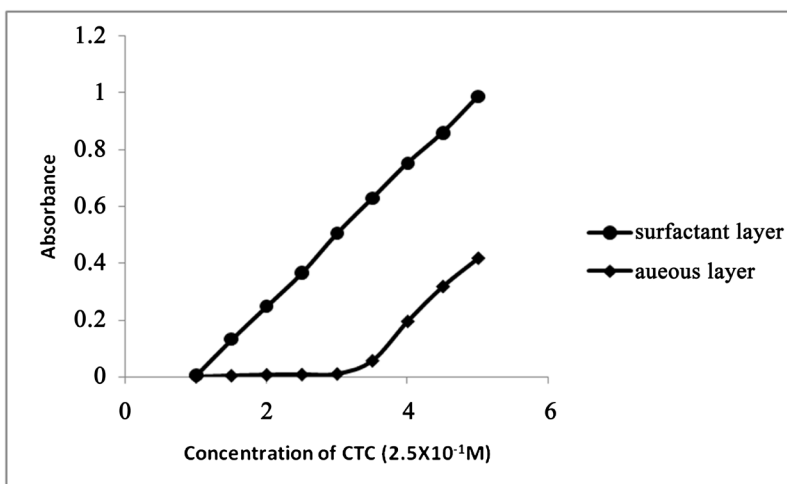


Figure 3. Effect of CTC concentration on the absorbance of the complex.

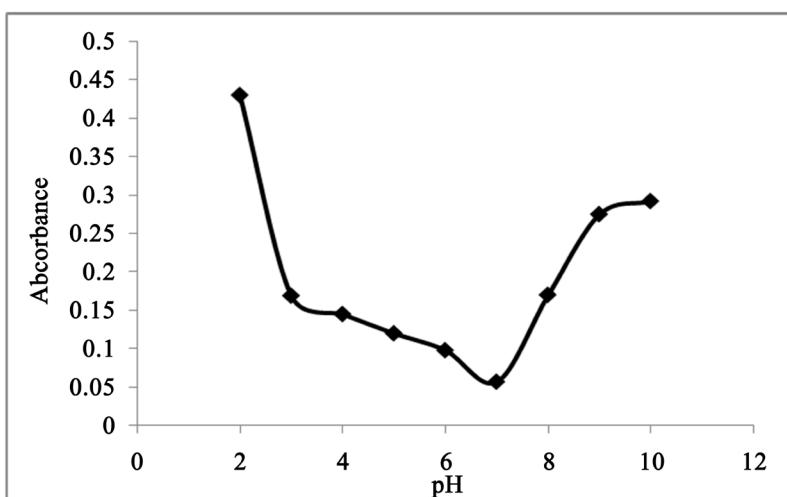


Figure 4. Effect of pH on the absorbance of the complex.

3.5. Effect of Triton X-114 Concentration

The influence of Triton X-114 concentration on the absorbance was studied by varying the concentration of it in the range of 0.01M to 0.13 M in the CPE procedure. The absorbance of the complex gradually increased as shown in **Figure 5** with the increase in the concentration of Triton X-114 up to 0.05 M and then decreased (**Figure 5** & **Figure 6**). 0.05 M concentration of the surfactant was chosen for the study.

3.6. Effect of Triton X-114 Concentration on Extraction Efficiency, Preconcentration Factor and Phase Volume Ratio

The effect of Triton X-114 on the % extraction efficiency was studied. It was observed that the % extraction efficiency gradually increased with the increase of Triton X-114 concentration up to 0.05 M and then decreased as shown in the **Figure 6**. The effect of the surfactant concentration on the Preconcentration factor and phase-volume ratio was also studied and the results were shown the

Figure 7.

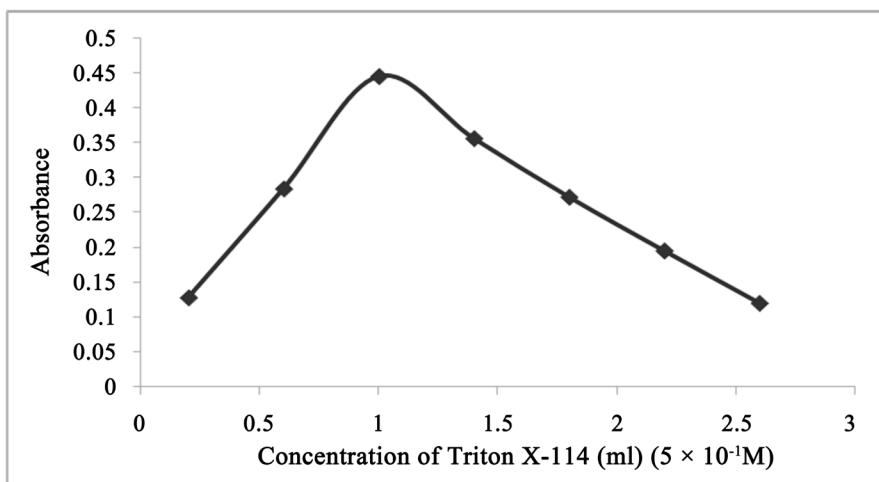


Figure 5. Effect of Triton X-114 on the absorbance of the complex.

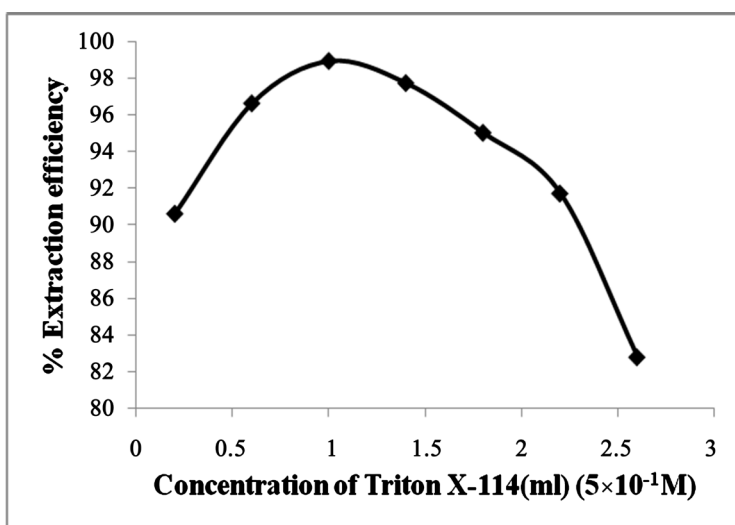


Figure 6. Effect of Triton X-114 on the % extraction efficiency.

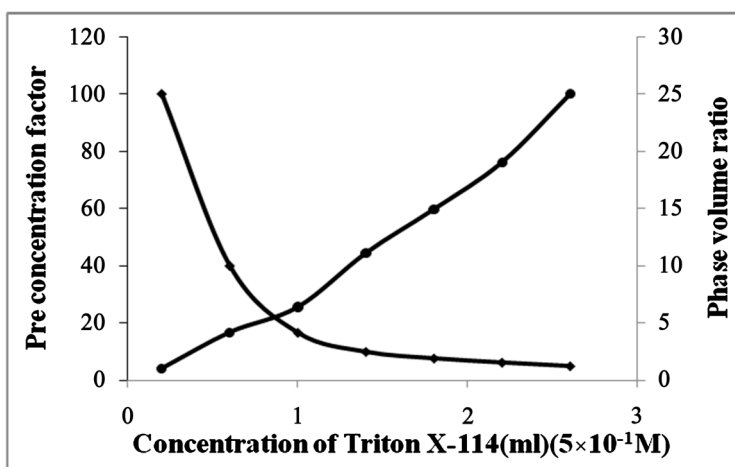


Figure 7. Effect of Triton X-114 on the Preconcentration factor and phase volume ratio.

3.7. Effect of Incubation Temperature and Time

It is desirable to employ the incubation temperature and time as low as possible to achieve complete separation of phases and to improve the efficiency of CPE. The effect of incubation temperature was studied in the range of 30°C - 60°C and 40°C was found to be sufficient for complete extraction. Similarly the incubation time was also evaluated in the range of 10 - 50 min. and for the completion of extraction, 30 min. time was found enough.

The influence of centrifuge time and speed on CPE were also studied in the range of 2 - 10 min. and 2000 - 5000 rpm respectively. It was found that 8 min. time and 4000 rpm speed were sufficient to achieve complete extraction.

3.8. Principle of the Method

Cobalt Thiocyanate (CTC) has been proved to be a valuable chromogen for the determination of amino compounds. Lisinopril has a secondary amino group and hence it was believed that the 2° amino group of the drug was coordinated to the Co^{2+} of CTC as shown in **Figure 8** in the following scheme.

3.9. Calibration Curve of the Proposed Method

A series of standard of LSP solutions ranging from 1 - 6 $\mu\text{g/ml}$ were taken and subjected to the general CPE and the absorbance of each solution was measured at λ_{max} of 625 nm, in order to construct the calibration curve as shown in **Figure 9** from which the amount of LSP was determined. The calibration curve of the proposed method was given below.

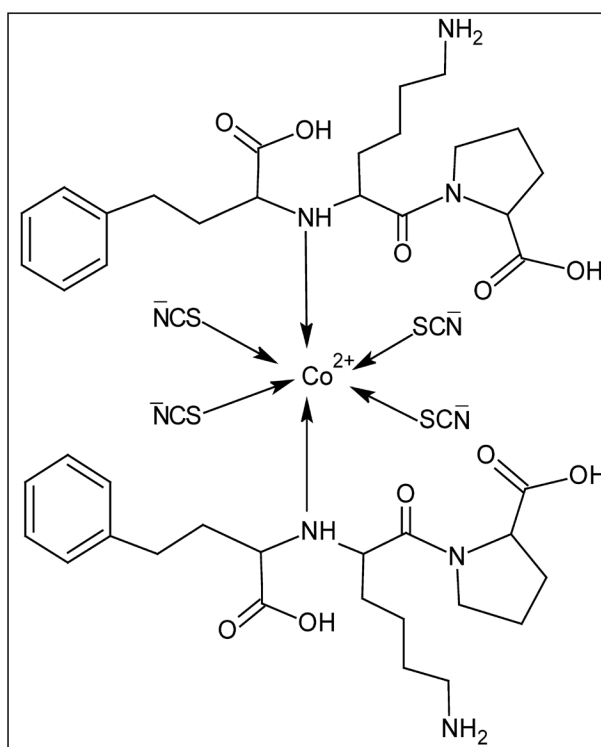


Figure 8. Coordination complex between LSP and CTC.

3.10. Evaluation of Calibration Curve

The statistical data obtained from the calibration curve were tabulated in **Table 1**.

3.11. Accuracy and Precision

Intra-day and inter-day was considered for the calculation of precision. Three concentrations of the drug were analyzed in six replicates during the same day (intra-day precision) and for three consecutive days (inter-day precision). **Table 2** and **Table 3** given below illustrates the analytical results. For the quality control analysis of the studied drug, the reported precision was adequate and relative standard deviation percentage (RSD%) was satisfactory.

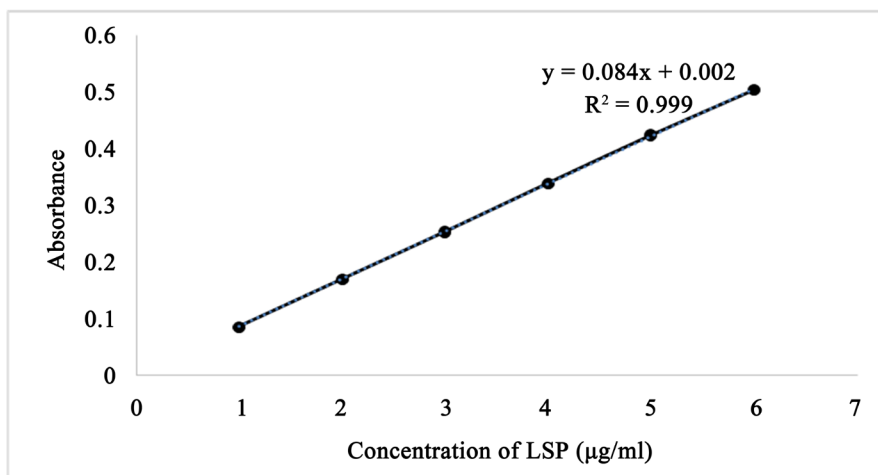


Figure 9. Calibration curve of the proposed method.

Table 1. Statistical data.

Parameter	value
λ_{\max}	625 nm
Beer's Law limits	1 - 6 µg/ml
Molar absorptivity ($L \cdot mol^{-1} \cdot cm^{-1}$)	3.53×10^5
Sandell's sensitivity ($\mu g \cdot cm^{-2} / 0.001A.U$)	0.0115
Regression equation	$y = 0.0842x + 0.0021$
Correlation coefficient (r)	0.9999
Coefficient of determination (R^2)	0.9998
Std.error of regression (s_e)	0.00165
Std.error of slope (s_b)	0.000395
Limit of Detection (µg/ml)	0.0588
Limit of Quantization (µg/ml)	0.1964
Preconcentration factor	100
RSD% (n = 6) at 5 µg/ml	0.51

Table 2. Analytical results (Intraday).

Drug	Taken ($\mu\text{g}\cdot\text{ml}^{-1}$)	Intraday accuracy and precision			
		Found ($\mu\text{g}\cdot\text{ml}^{-1}$)	Recovery %	% RSD	RE %
LSP	5.0	4.996	99.92	0.51	-0.078
	5.0	4.992	99.8	0.69	-0.0667
	5.0	4.978	99.57	0.43	-0.044

Table 3. Analytical results (Interday).

Drug	Taken ($\mu\text{g}\cdot\text{ml}^{-1}$)	Interday accuracy and precision			
		Found ($\mu\text{g}\cdot\text{ml}^{-1}$)	Recovery %	% RSD	RE %
LSP	5.0	4.996	99.92	0.51	-0.078
	5.0	5.0	100	0.66	0.00
	5.0	5.03	100.67	0.34	0.67

Table 4. Assay of Lisinopril drug in pharmaceutical formulations.

Formulation/Tablet	Labeled amount (mg/Tablet)	Amount found (mg)	% recovery	% RSD
LISTRIL	2.5	2.495	99.8	0.45
CIPRIL 5	5	5.02	100.3	0.90

3.12. Determination of LSP in Pharmaceutical Formulations by Proposed Method

The proposed method was also employed for the determination of LSP content in two selected tablets containing LSP such as Listril (Torrent Pharmaceuticals Ltd. India) and Cipril 5 (Cipla, India) with stated values of 2.5 mg and 5 mg respectively. The results are tabulated in **Table 4**. The results obtained are satisfactorily accurate and precise as indicated by the excellent% recovery. It was found that the excipients and other active ingredients present in pharmaceutical formulations did not interfere with the proposed method.

4. Conclusion

The new spectrophotometric method developed for the determination of LSP is more sensitive, reproducible and less expensive when compared to other spectrophotometric methods reported. The developed CPE—spectrophotometric method was characterized with simplicity, good sensitivity, and low detection limit and reliable for the determination of LSP. In comparison with the existing visible spectrophotometric methods for the determination of LSP, the present modified method can be considered green as it makes use of spectrophotometry without the usage of organic solvent.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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NANOCOBALT OXIDE FOR THE ADSORPTION OF RARE EARTH ELEMENTS {LA(III) & ND(III)} - ADSORPTION ISOTHERMS AND KINETICS

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ABSTRACT

Nano metal oxide (Co_3O_4) is prepared efficiently in a simple, eco friendly and cost effective manner. Thermal decomposition of metal oxalates, which lead to transition metal oxide is considered to be a versatile method for the synthesis of transition metal oxide. Various characterization techniques like XRD, FTIR, SEM and EDS are applied to explore the morphology, bonding nature and size of the nano particle synthesized. Adsorption of rare earth elements {La(III) & Nd(III)} onto synthesized nanocobalt oxide is further studied using ICPAES method. The influencing parameters such as the adsorption efficiency, which include contact time, pH, initial concentration, and temperature, are studied. The adsorption isotherms, kinetics and thermodynamics are analyzed. It is observed that adsorption studies follow Pseudo second order kinetics and follow adsorption isotherms of Langmuir.

KEYWORDS: Nanocobalt oxide, Rare earth elements, Adsorption, ICPAES technique

1. INTRODUCTION

The surface area of crystalline materials increase with decrease in particle size, which increases the adsorption sites on the materials. Many metal oxides prepared by employing different synthetic routes [1-4], show excellent adsorption behavior. At room temperature pure form of cobalt is not stable as it can be converted to oxides like CoO , Co_2O_3 , and Co_3O_4 . Among all Co_3O_4 is the most stable phase and a P-type semiconductor, with high Young's modulus, which varies between 115 and 160 GPa. Normal crystal structure with occupation of tetrahedral sites by Co^{2+} and octahedral sites by Co^{3+} is exhibited by Co_3O_4 . Magnetic moment is due to Co^{2+} ions largely because of spins, with a small contribution from spin-orbit coupling [5].

The nanopowder of cobalt oxide is extensively applied in gas sensor [6], magnetic [7], catalysis [8], lithium ion batteries [9], and electrochemical [10] depending on the structure, size, shape, and phase homogeneity and with surface morphologies. So much experimentation was done for the synthesis of cobalt oxide nanoparticles in past decades by using several well established techniques, like precipitation methods [11], thermal method [12], sonochemical method [13] and pyrolysis process [14]. In spite, these techniques have a limited control in particle functional properties and the yield is very less. Hence there is an acute need to find an alternative method and novel technique for the synthesis of nanoparticles that should be versatile, cost-effective and eco friendly.

Present work, we propose a simple, eco friendly cost effective method for metal oxalate preparation. This method is novel and simply pouring of one reaction solution into the other one, which is just sufficient for metal oxalate precipitation. Further thermal decomposition is carried out to obtain Co_3O_4 , mesoporous metal oxides with a reasonable crystallinity.

Improper disposal of industrial effluent containing rare earth elements as well as various anthropogenic activities containing a wide range of potential contaminants pollutes water bodies results into toxicity to both human and aquatic life. REE form a coherent group and generally occur in the trivalent oxidation state [15].

There are various adsorbent materials (raw and modified) used for the removal of REEs from aqueous solutions such as, silica gel particles modified with acid groups [16], cysteine-functionalized chitosan magnetic nano-based particles [17], modified red clays [18], marine sediments [19] carbonized polydopamine nano carbon shells [20], granular hybrid [21].

Several methods including chemical precipitation, ion exchange, electro deposition, membrane separation etc. are applied to treat aqueous solutions containing rare earth elements. Among all these methods, chemical precipitation is considered the most economic one but is not sufficient for dilute solutions. Most well known techniques are Ion exchange and reverse osmosis, but they have rather, high cost and heavy maintenance subjected to fouling. To overcome this problem adsorption is one of the significant alternatives, particularly using low-cost natural sorbents like zeolites, agricultural wastes, biomass, seafood processing wastes, clay materials and natural waters [22].

ICP-AES occupies an invaluable position in the modern analytical laboratory due to its excellent sensitivity, simplicity, precision and accuracy and very limited interferences[23]. In the past, until time of the advent of ICP-AES, the determination of REE in geological samples was an expensive task and difficult and involving separation of the REE by utilizing time consuming methods like solvent extraction, ion exchange and precipitation, prior to analysis by techniques such as ICP-OES and XRF.

Here authors make an attempt to exploit meso porous Co_3O_4 synthesized through thermal decomposition method as an adsorbent for the adsorption of REE in the form of La (III) & Nd (III) using ICPAES method. The adsorption isotherms and reaction kinetics are studied for the above mentioned systems.

2. EXPERIMENTAL DETAILS

Cobalt nitrate hexa hydrate $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ and Sodium oxalate ($\text{Na}_2\text{C}_2\text{O}_4$), Lanthanum nitrate hexahydrate $\text{La}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$ and Neodymium nitrate hexahydrate $\text{Nd}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$ are used. All chemical reagents are commercial and of analytical grade, used directly without further purification. All the stock solutions are prepared from reagent grade compounds using double distilled water.

Synthesis of nano mesoporous cobalt oxide:

The experimental approach for metal oxalate synthesis is discussed in detail. 100 mL of aqueous saturated sodium oxalate solution was added into a flask and stirred at room temperature. Then slowly 7.6 g of $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ was dissolved into 20 mL of water and then poured into the above sodium oxalate aqueous solution under continuous stirring. After fifteen minutes, the precipitates were collected by filtration and subsequently washed by distilled water and ethanol. Thereafter, the powder was dried at 80 °C overnight.

The synthesized metal oxide Co_3O_4 is characterized using various analytical tools such as XRD, SEM-EDS, FTIR, and BET in order to obtain the size and various functional groups, elemental composition material characterization and surface area and porosity of the synthesized material.

3. RESULTS AND DISCUSSION

Characterization of Nanometal oxides

The size and morphology and the of synthesized Co_3O_4 nanoparticles are characterized by XRD, PAN analytical -X' Pert Pro X-ray diffraction instrument ; Cu Ka line ($\lambda = 0.154 \text{ nm}$), FT-IR/Fourier Transform-Infra Red Spectroscopy (In the range of 400-4000 cm^{-1} using KBr disc method), EDS –Energy Dispersive Spectroscopy , SEM/ scanning electron microscopy (The JEOL JSM-7600F FEG-SEM) and HR-TEM, high resolution transmission electron microscopy (HRTEM Jeol/JEM 2100) and BET.

XRD of Nano metal oxides

The synthesized oxides Co_3O_4 are structurally characterized by XRD, using the sample scanned from 10°-80° at a scanning rate of 0.4°/second. From Scherrer Equation (1), it was confirmed that the synthesized metal oxides Co_3O_4 have the crystallite size of 30.22 nm. Figure 1 is well matched with the standard JCPDS file

Scherrer Equation, Crystallite size = $0.9\lambda / B \cos \Theta$ (1)

Here λ = X-ray wavelength,

B = Full width at half maximum intensity of the peak

Θ = Bragg angle

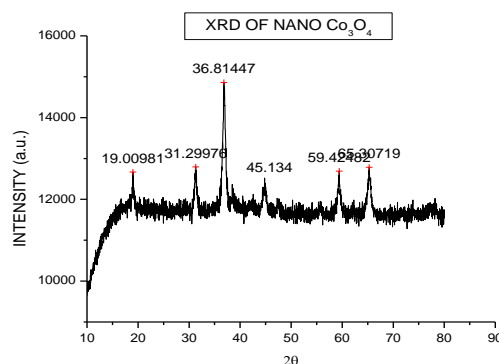


Figure1: XRD Patterns of nano Co_3O_4

FT-IR Spectra of Nano metal oxides

The synthesized metal oxides Co_3O_4 is characterized by FT-IR spectra shown in figure 2 is in the range of $400\text{-}4000\text{ cm}^{-1}$ using KBr disc method. It is observed a stretching frequency at 3422 cm^{-1} and a weak asymmetric band at 1627 cm^{-1} support the presence of OH^- group due to the absorption of water by nanoparticle during sample preparation.

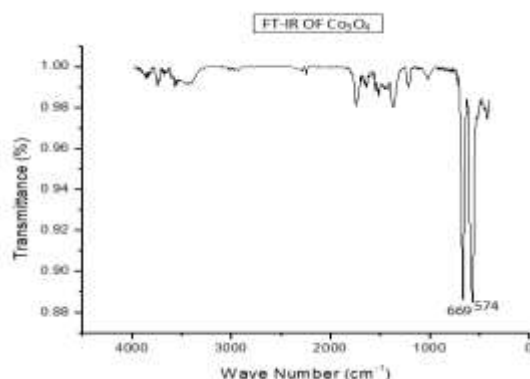


Figure2: FTIR of nano Co_3O_4

The presence of two strong M–O stretching and bending frequencies at 669.69 cm^{-1} and 574.74 cm^{-1} , respectively, supports the presence of phase purity with mono dispersity in the face centered cubic structure [12]. Generally nano materials absorb moisture from the environment, because of which low intensity peaks of $-\text{OH}$ in the FT-IR spectra are observed.

SEM and EDS of Nano metal oxide

SEM-EDS. Figure 3 supports the microcrystalline nature of the particle after calcinations with least degree of agglomeration. Particles seem to have an irregular shape with chemical homogeneity with uniform morphology due to the presence of inter particle surface connectivity. It was observed that the annealing temperature increases the crystalline nature of the particle that changes due to nucleation [24,25]. The morphologies of the Co_3O_4 , are in spherical structure whose dimensions are in nanometer scale.

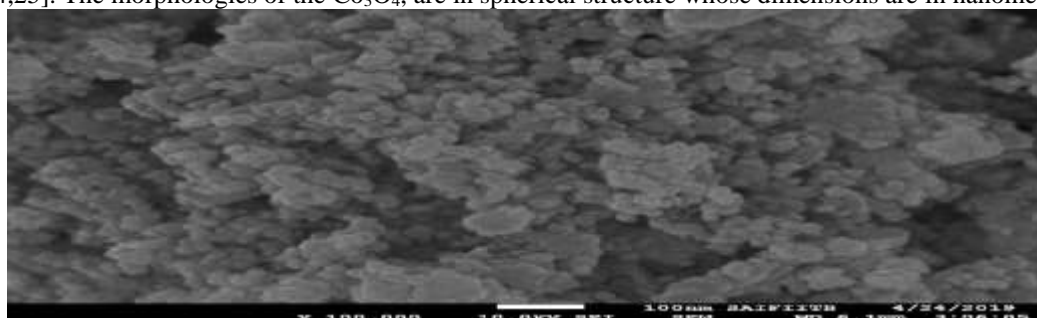


Figure3: SEM of nano Co_3O_4

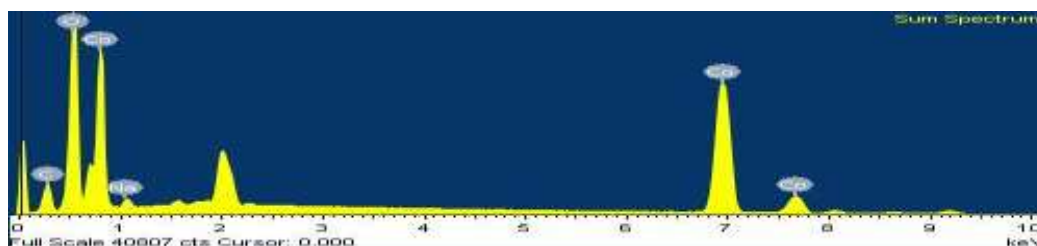


Figure 4 : SEM- EDS of nano Co_3O_4

Table 1: Elemental Composition of Co_3O_4

Element	App Conc.	Intensity Corrn.	Weight%	Weight% Sigma	Atomic%
C K	3.36	0.5229	7.49	0.11	19.91
O K	25.89	1.5214	19.83	0.08	39.58
Na K	0.59	0.5245	1.32	0.04	1.83
Co K	56.05	0.9148	71.37	0.12	38.68
Totals			100.00		

BET analysis

Brunauer – Emmett – Teller (BET) analysis was employed for exploring the specific surface area and porosity. Here the material is chilled to liquid nitrogen hotness and depicted to a nitrogen (gas) adsorbent. The BET surface area of nanoCo₃O₄ is measured to be 88.37 m²g⁻¹.

Batch adsorption study

Another important objective of this work is to adsorb REEs such as La(III) and Nd(III) from aqueous solutions using Co₃O₄ nano particles using ICPAES technique. Several experimental parameters like initial dye concentration, adsorbent dose, contact time, solution pH and temperature can affect the extent of removal of REE. Several batch adsorption studies were conducted at 313K. The adsorption studies are done to investigate the variation of REE strength, nano particles amount (1to30 ppm) and temperature (293,303,313,323K). The experiments were conducted by varying one of the parameter while keeping other factors fixed. After fixed intervals of time (10min) the strength of the dye was monitored by applying ICP-AES technique.

Effect of pH

Solution pH is a crucial feature in operating the adsorption capability of REE on to adsorbent (nanoCo₃O₄). Figure 5 describes the percentage removal of La(III) and Nd(III) vs Co₃O₄ at various pH values. Various pH ranges acidic, neutral and basic are used for adsorption studies. Graph shows that the pH of the both REE is “6.5” for the optimum adsorption on to the prepared Co₃O₄ nano particles. Hence acidic pH is preferred for further the batch adsorption studies

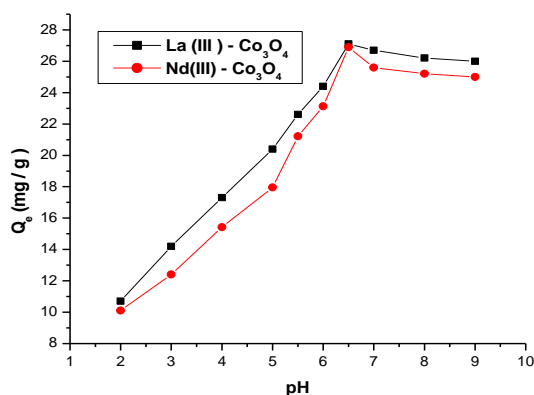


Figure 5: Effect of P^H on adsorption of La(III) and Nd(III) on nano Co₃O₄ particles at 313K

Effect of contact time

Several batch adsorption studies are conducted for REE {La(III) and Nd(III)} in the concentration limit from 1 - 30 mg/L on Co₃O₄ nano particles respectively. The quantity of REE being removed on the surface of nano structures enhances on increasing time of contact till a plateau is reached. This explains the dynamic equilibrium state of the REE, where the quantity adsorbed on to the adsorbent Co₃O₄ is in equilibrium with that of rare earth element in the solution. At 40 minutes the equilibrium is observed for both the REE on Co₃O₄ nano particles. The mechanism explains the confirmation of pollutant molecules to the outer layer before the dispersal on to the surface of adsorbent and then completely entry in to the permeable arrangement of nano structures.

There is repulsion or electrostatic hindrance among the adsorbed effluent on to the adsorbent surface. Finally on increasing, effluent strength, the quantity of pollutant adsorbed for every part (quantity) of Co₃O₄ (unit adsorption capability) enhances, while it decreases with increment in the adsorbent dosage because of unsaturation of adsorption sites.

Effect of adsorbent mass

Adsorption studies were carried to know about the outcome of adsorbent amount on removal of La(III) and Nd(III) on changing the quantity of adsorbent in the limits for fixed concentration of REE at constant temperature of 313K. On enhancing the adsorbent

amount from 5- 20mg, adsorption percentage enhanced along less equilibrium time. The existing places on the adsorbent became restricted at higher concentration, and hence no additional adsorption, which could be explained with enhanced surface area, abundant sites for adsorption. The quantity of adsorbent mass is observed to be 10 mg for removal of La(III) and Nd(III) respectively.

Influence of initial dye concentration

REE concentration influences in the removal of effluent by nano particles at the pH value of 6.5 value at 313K is shown in figure 6 and figure 7 respectively. The pollutant concentration used in the experiment was 1 to 30 mg L⁻¹. At lower concentrations the effluent material in solution reside in binding locations those are available on adsorbent. This grades an appropriate adsorption. The concentration of the REE was determined with various time intervals varying between 0 to 60 minutes. It is observed, the adsorption/removal of La(III) could be fast from the starting of the investigation and at the end, reached to equilibrium. Similar trend is observed in Nd(III) also. From the above results equilibrium time was 40 min, fixed throughout the experiment.

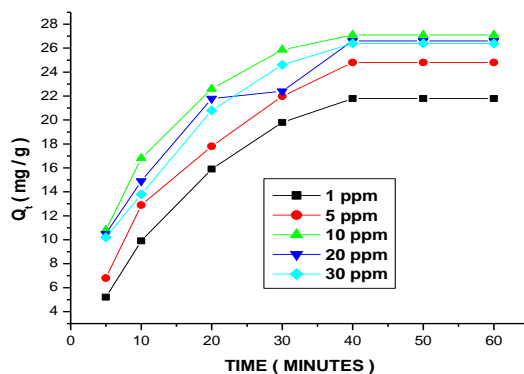


Figure 6: Effect of REE, La(III) on adsorption onto nano Co₃O₄ at 313 K

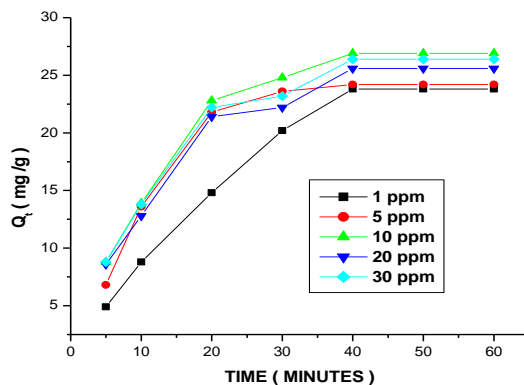


Figure 7: Effect of REE, Nd(III) on adsorption onto nano Co₃O₄ at 313 K

Langmuir adsorption isotherm

This isotherm explains the adsorption is appropriate near homogeneous phases, and is specific on the surface of adsorbent which is observed to be monolayer. The linear Langmuir isotherm model is given as

$$\frac{C_e}{q_e} = \frac{1}{K_L Q_0} + \frac{C_e}{Q_e} \dots\dots\dots(2)$$

Where the terms represent their own words. The important properties of Langmuir isotherm is explained by a fixed numerical value which is dimensionless and known as equilibrium parameter R_L.

$$R_L = \frac{1}{(1+K_L C_0)} \dots\dots\dots(3)$$

The rate of R_L expresses the behavior of Langmuir isotherm, which is irreversible (R_L= 0), favorable at conditions of 0 < R_L< 1, and Linear at R_L= 1 or not favorable at R_L> 1.

Table 2 Langmuir adsorption isotherms values for the adsorption of La(III) and Nd(III) on nano Co₃O₄

Isotherm Model	Parameter	La(III)	Nd(III)
Langmuir	Q_{max} (mg/g)	27.2479	26.2550
	K_L (L/mg)	1.0397	1.2476
	R^2	0.9960	0.9999

Figure 8 and Figure 9 represents the Langmuir isotherms of La(III) and Nd(III) by the adsorption onto Co_3O_4 nano particles.

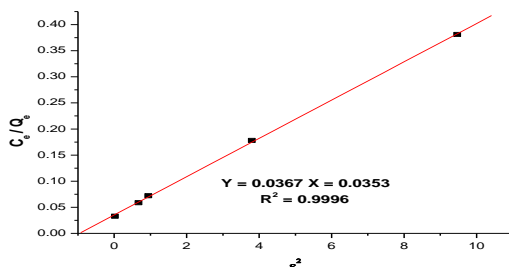


Figure 8: Langmuir adsorption isotherm in the adsorption of La (III) on nano Co_3O_4

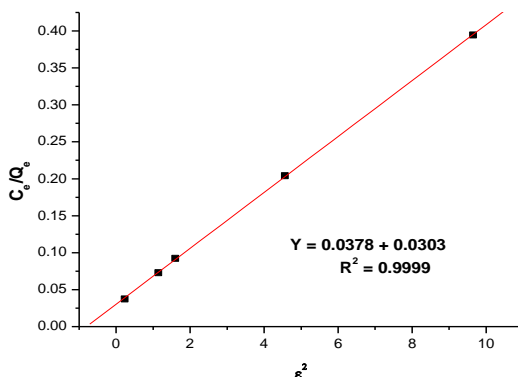


Figure 9: Langmuir adsorption isotherm in the adsorption of Nd (III) on nano Co_3O_4

The experimental value is in correlation with graphical value of Q for both REEs. From the result it is observed the Co_3O_4 nano particle has better adsorption capacity over the selected REEs.

Adsorption kinetics

The adsorption procedure is normally quick instead of inner and outside dissemination. But in elaboration, adsorption equilibrium time proposes that the interior dispersion manages the response rate. In this context the adsorption of effluent was applied to PFO and PSO expressions in evaluating the kinetics of adsorption technique. The result of the adsorption kinetics was gained for proposed REEs. The issues are observed in table 3. The adsorption kinetic plots for pseudo second order kinetics can be presented in figure 10 and 11 . Usually the correlation coefficient (R^2) value is the base and from which best fit can be selected. The linear formula of the Pseudo second order kinetic model equation can be presented

$$\frac{t}{q_t} = \frac{1}{K_2 q_e} + \frac{t}{q_e} \dots\dots\dots(4)$$

q_t (mg/g) = adsorbate strength at a given time t , q_e (mg/g) = strength of adsorbate at equilibrium, K_2 (g/mg min) = PSO rate constant. The linear graph of t/q_t vs ‘ t ’ can pursue the data of q_e , K_2 from the slope, intercept correspondingly. From the observation, the correlation coefficient values are nearly ideal. This indicates a better conformity with experimental, theoretical values. Furthermore better correlation is established among q_e values determined applying PSO model and experimental investigation.

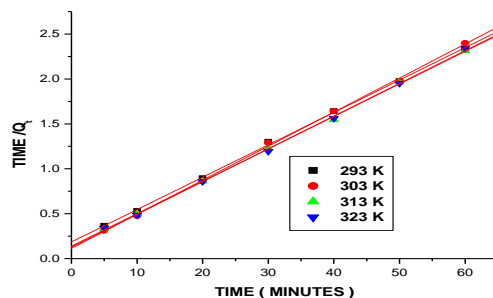


Figure 10: PSO kinetic model for the adsorption of La(III) on nanoCo₃O₄

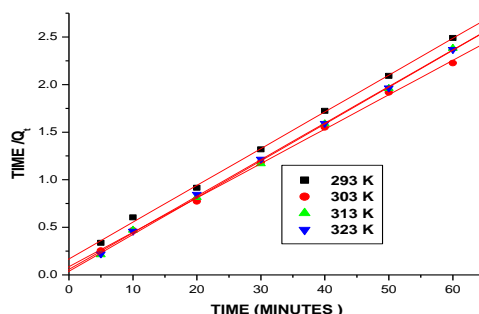


Figure 11: PSO kinetic model for the adsorption of Nd(III) on nanoCo₃O₄

Table 3 Pseudo second order values for the adsorption of La(III) and Nd(III) on nano Co₃O₄

Dyes	Q cal	Qobs	K ₂	R ²
La(III)	27.1	27.7008	0.0093	0.9994
Nd(III)	26.9	25.8339	0.0038	0.9989

Hence from Table 3. Pseudo second order model best fit into the kinetics.

4. CONCLUSION

From the above results and discussion it is understood that Co₃O₄ nano particles are successfully prepared and applied in the adsorption of rare earth elements like Lanthanum and Neodmium. ICPAES technique is applied for the entire study and factors effecting like pH, initial concentration of adsorbate, adsorbent, contact time are also investigated. The study extended to explore the feasibility of the reaction. The pseudo second order kinetics best fit into the model. Hence nanoCo₃O₄ is considered to be better adsorbents in the adsorption of rare earth elements.

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RESEARCH ARTICLE



WOMEN PORTRAYALS IN FINE CLOTHES TO THE JEW

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Abstract

One of the heroes of the Harlem Renaissance was Langston Hughes. He gave voice to African American women's plight in America. His poems are written in free verse and so they reach the masses easily. *Fine Clothes to the Jew* is one of the beautiful collections of poems that deal with men and women, their jobs, hopes, troubles, racism, and religion. The women's lives are portrayed lifelike in his poems. The article will analyse how he portrays the women characters and his mission in doing it.

Key Words: African American poetry, Harlem, African American women, blues and jazz.

SWARNA SRI YADADA

Introduction

Langston Hughes (1902-1967) is known for his colourful verses on various topics deeply steeped in the distinctive aspects of African American life with musical and blues rhythms. His collections of poetry include *The Weary Blues* (1926), *Fine Clothes to the Jew* (1927), *Shakespeare in Harlem* (1942), *One Way Ticket* (1949), *Montage of a Dream Deferred* (1951), *Ask your Mama: 12 Moods for Jazz* (1961) and *the Panther and the Lash* (1967) exemplified his remarkable fidelity to the literary vocation. The significant themes in Langston Hughes's work emerge from his personal life, travels, involvement in radical and protest movements, and interest in Africa, America and the Caribbean. His cultural heritage was a vivacious one. His poetic work revolves around racism, but he is not a racist. He always opts to speak to all Americans, especially on the issues of social, economic, and political justice. During Harlem Renaissance, Langston Hughes achieved eminence and respectability for his ability to express African American experience in his works. Hughes was the most influential and resourceful twentieth-century African American writer. He believes that American Blacks who have grown up in America are no more Africans but are Americans. They have the right to

exercise freedom in America as the Whites do. So, in his verse, he focuses on the deteriorated lives and livelihoods of the Negro masses in the urban backdrop of America. He aims to make people aware of the seamy sides of their lives.

Especially in his second collection of poetry, *Fine Clothes to the Jew*, Hughes presents a realistic depiction of Harlem life and the problems are faced by African Americans, especially elevator operators, porters, roustabouts, cabaret dancers, singers, job searchers, prostitutes and ordinary people walking down the street. He strives hard to draw out their conditions, emotions, feelings, hardships, etcetera. It is a more impersonal and innovative presentation of the Metropolis Black community in America. His voice sets the background for male and female characters in this fine collection. This poetry collection is a platform where readers can grasp an accurate social picture. The shown characters pour out their experiences, tales of their lives, thoughts, sensations etc., individually. His work also mirrors the gender racial conditions, harsh working conditions, and sociological conditions.

Hughes's writing is a broad spectrum of black women's amiability, strength, beauty, vulnerabilities, victimisation, insight, creative talent and sensuality. In other words, *Fine Clothes to the Jew* is a commensurate subject of the multilayer texture of black women's lives in American metropolis in the 1920s. It brings the readers to "the idea of Langston Hughes as a black male feminist." (Steven 132) Hughes never portrays women negatively though he talks about women of loose character or unrestrained nature. He targets the conditions which make women exist in such appalling conditions. The best examples of this category are "Gypsy Man," "Ballad of Gin Mary," "Ruby Brown", and "Red Silk Stockings."

In "Gypsy Man", a black woman pours out her life experiences. She is lonely as her man possesses the traits of a gypsy and therefore fails to quench her heart's thirst. He never tries to give her his company. So, she tries to adopt her man's nature—"wandering." She is in search of the right kind of man. She finds a yellow papa (Mulatto in origin). She gives him all her possessions—heart and money which she has earned. Unfortunately, she has not been given anything by him. So, ultimately, she notices the fact. The poem is quoted from the collection edited by Rampersad:

Love, Oh, love is

Such a strange disease.

Love, Oh, love is

Such a strange disease.

When it hurts yo' heart you

Sho can't find no ease. (78)

This poem delineates a variety of important issues— how the family fabric is attenuated by the negligence of a man in the black society, and of how a black woman is drifted towards prostitution or extramarital relationships in quest of love or to move away from loneliness, and of how a woman is exploited emotionally and financially.

In "Ballad of Gin Mary," Mary Jane is friendless, wholly addicted to gin, and on the cover, time taken to court for alcoholism. Judge Pierce looks at her since she is familiar with the court scene. She is jailed for eighteen months and does not bother about imprisonment. Her extreme worry is the deprivation of her tenure in jail. She had adopted this habit to alleviate her deserted life.

In "Ruby Brown," a beautiful black youth feels that prostitution is the better opportunity that can bring her recognition and money. She does not find this benefit in any other domestic job. Fulfilling

the physical needs of white men is an easier way to make money for black girls than any other means. They are even ready to be away from their folk. In this way, their promising future is indirectly the bud or crushed under the whites' sensuality. The black youth are attracted to prostitution for its availing opportunities, but they are not aware of imperceptible problems which occur in the latter part of their lives. This realisation has been highlighted in the poem "A Ruined Gal." It depicts the onerous demands of a black prostitute after her youth. Realisation dawned on her that the wrongs committed in her youth deprived her of even becoming a bride. She is left companionless for the rest of her life.

Many African American women are discouraged when their men leave them. They feel depressed and try to end their lives. Only a few have enough courage to lead their lives and to, somehow or the other, divert their minds. Hughes depicts this issue through the different perceptions of women in many portrayals of feeble and strong-minded women.

A couple of women in verse reflect their association with "Misery" and "Suicide. They are deceived and left out by their men. In the first case, the black girl wants to come out of her misery boldly by paying her whole attention to hear blues—"Play de blues for me. / Play de blues for me / No other music / 'Ll ease ma misery. //'" (76) She believes that only the blues has the elixir power to soothe her wounded heart. And there is a hope to come out of her misery from the routine. Whereas, In the second case, the woman decides to end desperately. She is in search searching for the better means or devices to die or bring tranquillity by it.

In "Evil woman," the male lover declares that he will kill his "Good gal" the next time as she makes him "sore." He says that though he treats her kindly, she does not treat him well. Instead, she quarrels with him almost every night. He calls her a 'blue gummed woman' from the South. He says he will send her back or use her head for "a carpet tack."

Here Hughes lets the black man speak of his hostile attitude towards his woman. Perhaps, she quarrels with him for his maltreatment or the sense of emancipation from his boorish male supremacy. "And her dark skin and southern training have made her strong intolerant of maltreatment." (Steven 129) Throughout his poetry, statements of insinuation have been made. Unless the reader delves deeper or knows the background of Afro-Americans in the Harlem Renaissance, he cannot comprehend

Hughes's implied sense or his profound ideas and sarcasm.

In the poem "Bad Man," a man suffers from imposed badness. He carries the burden of imposed badness and a sense of relief from this sort of pain, liquor along with him wherever he goes. He beats his women and is unaware of the reasons for his actions. He does not want to get rid of such notions or impressions of others. And he never expects better living conditions as he is already accustomed to them. He wants to suffer in this way forever.

His frustration or some other feeling perhaps compels him to behave so. The deeds of society victimise women. They are discriminated against or maltreated with double fold—race-wise and gender-wise. White society mistreats black men and women. Black men treat women consciously or unconsciously so bad with frustration.

In "Beale Street Love," Clorinda wants to accept her man's cruelty in the name of love. In her life, love is—

Love

Is a brown man's fist

With hard knuckles

Crushing the lips,

Blackening the eyes, (97)

This kind of harassment or brutality is not allowed by Cora in the poem named "Cora." She shuts and locks her heart because she is hurt by her man that morning. She does not want to be belittled in the name of love or even to search for another man's love. The readers can find the evolution of women psychologically. In the first case, the woman of loyal nature is presented, but in the second case, the woman of mental maturity is depicted.

In "Lament over Love," a frustrated-love victimised woman wishes that her child should not get such a problem—

I hope ma chile'll

Never love a man.

I say I hope ma chile'll

Never love a man.

Cause love can hurt you

Mo'n anything else can. (109)

Though she is aware of her being cheated by her lover, she likes to float in his memories. She

does not try to give him up in her thoughts. She believes one's happiness lies in love. Love is a kind of obsession to her. In her case, love is— Love is like whiskey, / love is like red, red wine. /....If you wants to be happy / You go to love all de time. //” (109) Her thoughts concerning love haunt her wherever she goes— perhaps it is a river, or it is a tower as tall as a tree. She only thinks of him. Her ultimate decision is to “fall” her “fool-self”.

A large proportion of this collection is about black males' mistreatment or exploitation of black women who have settled in different occupations, including homemakers. Hughes portrays women as love-seekers, amiable characters, self-sacrificing women, and women of forgiving nature who endure men's weaknesses. The black males beat and drag their counterparts down the streets, shattering black women emotionally and financially, and men's preference for light-skinned women etc.

In "Bound No'th Bluea," a Northern American black woman who is a gregarious kind likes to share her encumbered heart with somebody. She feels that love is a better substitute for eschewing loneliness. Nothing is found in front of her except a long road in the North. She walks on it continuously, which stands for her life's journey. She desires to meet a good pal and hates to be lonely and sad. But, she is futile in her attempt. She does not find any such destination in her life except disenchantment. This poem tells us how lonely one in industrial North America is even though people surround one. Modernity separates one from another. The people who are longing for family bonds or friendship bonds appear to be foolish. The following paradoxical lines support the essence of the poem:

Love is a protection against loneliness; but in love, as in other life experiences, things are not always what they seem. Things sometimes start out good, end up bad. Treachery in love and friendship sometimes forces one into self-protective... (Onwucheka 12)

It is proved in the case of women from the poems "Lament over Love," "Listen Here Blues," and "Cora." A woman who can not make herself come out of love wishes her child not to fall in it. She strongly believes that when he or she falls in love, it causes one to feel hurt. Another woman who is a victim of love and addiction warns the youth to be cautious of dangers to them. Cora is another black girl who does not want to humiliate herself by falling in love with another man, so she makes her heart impermissible in seeking or making love. These women strongly defend themselves against love as they are victimised in the name of love.

In "Gal's Cry for a Dying Lover," a black girl is lamenting a lynching lover who treats her kind though she is a "Black an' ugly." She prays for God's mercy not to take her kind man's life when she hears bad omens like "de owl a hootin'" and "Hound dawg's barkin'."

"Song for a Dark Girl" describes a black woman's lamentation over the loss of her lynched lover. She does not blame the white society, but she seeks justice from "the white Lord Jesus." She has lost her beloved with this racial violence of lynching. It haunts her throughout her life—"Way Down South in Dixie/ (Bruised body high in air)" and "Love is a naked shadow/ On a gnarled and naked tree." (107) "Young Gal's Blues" is a fine blend of a girl's practical bent of mind and mechanical attitude to life. It emerges out of her grief. She wants to accompany her dead friend, Cora Lee, to the graveyard because one day she will die, and somebody will walk behind her. She comprehends that death is the inevitable occurrence of death in one's life. Her perception is quite different from others as they usually participate in the funeral rites concerning the dead person.

She wants to visit her old Aunt Clew because she is also growing older and will expect somebody's visit at the later stages of her life. Her failure of love makes her think so desperately and makes her day-to-day activities of life mechanical. The sense of loss in love makes her feel about the death of life and old age. She questions what a young girl can do when love is gone. The days seem like lonely and cold. She feels love is an eventual step to living happily in one's youth. So, she craves love—"Keep on a-lovin' me, daddy, / Cause I don't want to be blue. //" (111) Black women's lives revolve around love. They try to find happiness, life and enjoyment in love. They are deeply hurt when they are deprived of it. It is one of the serious issues many writers have neglected in Harlem literature. But Hughes speaks of every issue which affects the black woman directly or indirectly.

In "Listen Here Blues," an experienced woman addresses the young girls as "sweet girls" and "good girls" and asks them to away from gin and whiskey, which makes them lose their virtue or chastity or virginity or innocence. She used to be a good child, but this liquor habit makes her "everybody's fool." These habits prompt them to go to men. Perhaps they bring misery in the name of love or some other thing. Here she declares that the men cause women's sad state. This kind of thought comes over the minds of black women as they experience cheating, brutality, insults and all kinds of suffering from men.

Male egoistic sense is vividly found in the poem "Hard Daddy." So, she wishes to have wings like the eagle and scratch his two eyes. It has an autobiographical note—Hughes encountered racial rejection from his father. He regretted having such feelings and had even separated from him. Psychologically, this incident affected and disturbed him for a while. But, he emerged from it and proved himself to be a renowned Negro artist and a racial mountain throughout his writings.

In "Baby," Hughes portrays a cautious mother who warns her child, Albert, not to play on the road since it is unsafe due to plying which run over him. This poem represents the tender and protective hearts of black mothers. This verse has a significant symbolic note—black people may be trampled under the advanced and materialistic white nation. So, the African American sagacious soul warns her youth to be aware of that and not lead their lives in the arena of the white folk.

In "Minnie Sings Her Blues," a black girl's reminiscence about her celebrations of love at the cabaret speaks of her blissful mind. It is the place where she and her man leave their troubles at the door. They dance with each other to jazz music. She proudly says that no other girl would have a chance to dance with him when she cuddles up to him. But now, she comes to reality and pours her sad heart through the "blues" music. In time, she deserted her man, and so, she explains to herself that she is not loved by him and decides that her ultimate step is to die—"If he didn't love me/ I'd go away/ An' dig me a grave this very day. //" (101)

Black women's superstitious notions are found in the poems like "Gal's Cry for Dying Lover" and "Bad Luck Card." In the former one, the owl's hooting and dog's barking bring to a black girl's mind that somebody especially close to her is about to die. In the later poem, a black girl who her lover rejects associates her bad luck with the gypsy man's fortune-telling. He shows her a bad luck card and says he would have killed himself if he were in her place. She bluntly believes in it and imagines that she is such an unfortunate girl.

In "Dressed Up", a black girl's inferiority complex is shown vividly. She wore clean clothes, a fine hat and new shoes, yet she may not be loved or looked at by anyone. She is dissatisfied with her skin colour, which is the reason for her desolation in love.

Some black women grab even the sordid aspect of their men as pleasant memories. Love dominates them. For example, the woman in "Ma

Man” celebrates her happiness with her man as follows: “Eagle-rockin’, / Daddy, eagle-rock with me. / Honey baby, / Eagle-rockish as I kin be! /” (114) Instead, she regrets that she loves his vulnerabilities as much as she loves his strengths. She says that his grave look and harsh deeds (“electric shocking eyes” and “he shocks me”), gloomy nature and alcoholic habit are as sweet as his gift of playing the banjo. It is a beautiful thing to discuss that many women before the twentieth century had the quality of accepting their men wholeheartedly with their strengths and vulnerabilities. These African American women are not exceptional cases. However, modernity affects the minds of many women on the European and Asian continents since they look for better persons to be their partners. They are intolerable of their men’s exploitation or fallibilities, but this change does not occur among the black women of America. They are the perfect models for amiability and fidelity.

“Closing Time” is a poem about a drowned black young girl. The poet evokes our attention by saying she remains “blue-white.” Indirectly he speaks of her lifelessness or death. The hubbub of taxi drivers and divers and their terse responses in that scenario create suspense, but the narrator is clever enough to say, “The river and the moon hold the memories.” He does not reveal the reasons for her death. Society shows no sign of sympathy towards her end. The formal funeral process is people’s ultimate goal to calm the situation.

A black girl’s obsession with death is notable in the poem “Mammy.” It signifies end to her. She is awaiting her mammy, i.e. death. She asks the one who takes such a decision to meet death, to speak “softly” and “slowly.” She compares death with mammy as the mother gives peace to her turbulent heart or mother stands for solace and friendliness. This poem reminds us of Emily Dickinson’s fascination with death as it was her friend, lover, provider of immortality etc. We are not aware of the girl’s reasons for awaiting death. Perhaps, she calls death mammy to keep the facts and her suffering secret.

The poems “Closing Time” and “Mammy” show us black women’s disgust towards existence. The former ends her life without speaking of her problems, and the latter waits for her doom day. They are reluctant to speak of their difficulties but think death is the ultimate solution to their troubles.

Conclusion

The anthology analysis has found that Hughes does not evaluate what is good and bad in women’s lives. He elevates what they are; how are their living conditions, how do their psychological

phenomena work in the course of their misery, and what are the aspects affect them the most through their tales. He speaks of their emotions. Often, he is one among them to talk about their problems. He views their issues from a humanitarian point of view. He condemns the worst situation indirectly by making people think of them. Sometimes, he probes the minds of his protagonists by discussing every aspect of their lives and the other times; he leaves it to the readers to interpret the implicit meaning of his verse to extract the truth of their lives. His poetry gives a more extensive scope to understand the lives of black women. Many of the tales witness the cause of their suffering. Society, as well as its men, is the reason for their endless suffering.

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THE SUBALTERN CAN SPEAK IN THE SELECT WORKS OF BAMA

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ABSTRACT

This paper attempts to focus on Bama's selected writings in reference to Gayatri Chakravorty Spivak's critical theory of postcolonialism, Can the Subaltern Speak? Being a Dalit woman, she discusses the issues of Dalits, especially women's problems, in her writings like Karukku and Sangati. Many of the problems of a Dalit woman converge on the caste system. In a detailed fashion, she depicts the cramped lives of Dalit women through the characters. Meanwhile, she also portrays their strengths and her life as an example of empowerment. Her mission is evident in connection with the literary sphere and social issues. She has opted for literature as a powerful medium to protest social evils. She discusses how she has attained her self-identity through her literary contribution. With the help of individual identity, Bama has given a voice to her peripheral group and battled seriously to free them from the grips of the caste system. Bama's discussions, characters in her works and her mission of life together prove that a Dalit woman can speak.



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Keywords: subaltern, postcolonialism, caste, gender, class, patriarchy, Dalit, women, triple marginalisation.

There were a lot many examples of subjugation in different spheres of life in different parts of the world. The source of suffering in England is classism, racism in America, and casteism in India. Along with this, one more aspect that receives excellent

attention everywhere and all the time is gender bias.

As far as Indian English Fiction is concerned, it has also contributed a lot to delineating all facets of the life of humans and even the issues in its birth land. Literary

discussions and literary expressions about local caste issues by Idayavendan, Abhimani, Unjairajan, Vedivelli, Marku, Bama and P. Sivagami unveil inherited slavery, all kinds of exploitation, ill-treatment and so on. According to one of the literary critics, Srinivas Iyengar, a caste system is the root cause of intimidating democracy and weakening unity in diversity.

Bama's novels discuss a strong-rooted problem, casteism about gender. Once, it was a neglected area of discussion. Only a few male writers, other than Dalits like Mulk Raj Anand, voiced the conditions of Dalits in the name of untouchables or outcasts or paraya but not Dalit women's issues. Anand's observation regarding untouchables is limited because he showed only the protagonist Bhaka, who belonged to a low caste, and his daily activities, his interaction with the people around him and his suffering in the process in an empathetic manner. To a large extent, Bhaka represented the people of his community but not the whole. Sohini, Bakha's sister, is the only woman character in the novel, *Untouchable*. Her portrayal was dealt with on a surface level. In fact, Women's issues were a neglected area of discussion. Whereas now, without hesitation, women writers, with their subjective experiences, have voiced every subject concerning women.

According to *Can the Subaltern Speak?* by Gayatri Chakravorty Spivak, no speech is possible in the subaltern position. That position makes people disempowered; their voices cannot be heard, and the heard utterances cannot be encoded and left as meaningless utterances. Hence, the people in that position cannot create their own identity to meet their needs and follow their interests, especially for not having the appropriate agency or medium to carry from one channel to another. In a typical scenario, Spivak's

constructive argument has a great value, and to a large extent, her argument cannot be thrown aside. However, agency or medium can be made, and ways to empowerment can be found. Bama's life and her writings mirror the possibility of subaltern speech.

Faustina Mary Fathima Rani is Bama's full name. She is a Tamil Dalit feminist writer of the modern era. In Tamil, 'Fa' is written as 'pa' and pronounced as 'ba'. The blend of two letters from each word is Bama.

Karukku is her autobiography, the first autobiography in Tamil Dalit literature. *Karukku* is a frequently studied and researched text in academic circles and in colleges, not just for its style but also for its content, which narrates the atrocities against the Dalit community. *Karukku* is a Tamil word which means Palmyra leaves. Its saw-toothed edges on both sides seem like double-edged swords. Her memoirs reflect her miseries and her community's woes as well as the bright sides of their lives and detail the daily lives of Dalits, their tastes, religions, festivals, entertainment sources, living style, games, culture and beliefs.

Sangathi is Bama's second novel. The title means news full of interrelated daily activities in the Dalit community. In this work, she deals with her personal life events with the association of the three consecutive generations of women in connection with family and society. In this novel, she rejects Dalit women's passive self-image in Dalit literary discourses and celebrates their self-pride and dauntless spirit. In other words, she shows that Dalit women transformed from mute objects to strong and expressive.

The Dalit women are triply marginalised in Indian society because of the overlapping structures of caste, class, and gender. Caste and class are interlinking

aspects, especially for Dalits. Their caste is a significant hindrance to making money, but their services are cumbersome and demanded ceaselessly by all sects of people for scavenging, cleaning, farming, etcetra. That is the reason the women from that caste are marginalised threefold.

Bama discusses sandwich issues, especially caste + gender + class issues in *Sangati* in a gripping alive fashion. The state of the sandwich problem is just like a spider's web. It causes a person annoyance and throws him/her into despondency or passing the way without a goal. Mariamma *In Sangati* lost her mother, and her life was an example of victimisation in triple-fold marginalisation. She was not allowed to take education from an early age. She was subjected to sexual assault by an upper-caste man, Kumarsami Ayya, when she went to fields to gather firewood. In Panchayat, Ayya manipulated that Mariamma had had an illegitimate relationship with her cousin. He made her feel shame and pay a dear price as a penalty.

Bama's work challenges the Dalit and feminist discourse paradigm by analysing the overlapping structures of caste, class and patriarchy regulation in an attempt to subvert them. According to her, Dalit women can create freedom and enjoy it. Their individuality is one of the appreciative traits. It helps them to live as they are. Their existence is mask-free and clear to them though it is hard. Therefore, they work out the things and identities that they need. These traits (creating personal and emotional space/freedom and individuality) are not found in their upper-caste counterparts. In Karukku, her name was unidentified until the end of her narration. However, her response to it has created an indelible mark on the literary firmament and contributed to establishing her self-identity too.

Bama mentions a point in connection with the fights and quarrels of men and women in the Dalit community - if men show muscle strength, women reveal their tongue's sharpness. This particular approach for these women helps them to relieve psychological strain. Sebasthiamma, Rakkamma, Kalliamma, Susaimma. Bhakkiyam, Velliamma, and Mariamma are rebellious characters of this kind in the fiction of Bama.

Dalit women do not have a practice of performing pada puja (worshipping the husband's feet). Many of the castes in Hinduism follow pada puja. They treat their husbands as superior to them. However, in the case of Dalits, women shower their love and affection but never feel men are their superiors. They do not let themselves go down in a dispute with their husbands. They opt to give equal retorts to their men is quite common. Kancha Ilaiah states that Dalits are more democratic than the followers of a patriarchal system.

Bama has stated the reasons behind their cries, shouts, bawls and curses. After having the tiresome work of the day, their bodies cannot support them to have a sexual life. With partners' force, they do it but feel discomfort. In her observation, Dalit women are 'the worst sufferers'. In reality, they are receiving a negligible amount of ill-treatment from their men folk but more from men and women of the upper caste masters. In *Sangati*, it is shown as, "The position of women is both pitiful and humiliating, really. In the fields, they have to escape from upper-caste men's molestations. At church they must lick the priest's shoes and be his slaves while he threatens them with tales of God, Heaven and Hell." (*Sangati*, 35)

Exploitation can be exercised regarding physical labour, sexual abuse, feelings and emotions. Besides not giving support to a

victimised woman, women of upper caste do not conceal their aversion to seeing them and dealing with them. Following the essential etiquette like giving respect to a person or honouring one's self-respect is a healthy habit of humankind. It finds rare in many of the upper caste people. She accuses society in *Karukku* of their rude and impassive responses toward Dalits. They treat Dalits are not human beings.

Bama, in her novels, shows that Dalit women are stronger and more self-reliant than upper-caste women, especially in financial matters, problem-solving and decision-making areas. Mostly they meet their financial expenses on their own. They never like to hide their skills. They like to deploy their art fruitfully. They never show their back to take up the challenges. They never escape from their responsibilities. In *Sangati*, Vellaiyamma, Bama's grandmother takes complete responsibility for rearing up to her two daughters after her husband left forever for Sri Lanka in search of a job as a tea plant labourer. They look after their children and do daily chores apart from their outside business. They are always close to nature. Coming to the upper-class, women rely on their men for the need for money, for taking up a subject, vocation, or avocation. In fact, their every action is controlled by their men.

Bama used the positive elements of her life journey to shape her personality from marginalised to the mainstream. She has employed education and her experiences as a stock resource to address issues of Dalit women. She wishes to see the condition of Dalit women be uplifted with education. She believes that education makes a woman courageously face the challenges in her life and solve the problems. Her keen observation of individual and social aspects has contributed to a solid aspiration of

constructing a society free from vices like exploitation, humiliation, and inequalities. She also calls for her women to uphold their rights. She has given a voice on behalf of them to solve their issues like no identity, inequality and disrespect.

Lakshmi Holmstrom has described Bama's approach to life in her introduction to *Karukku* to *Sangati*, "...she will have a chance to change things to redress the balance from humble acceptance of oppression to staking a claim for justice". In Bama's own words, it is comprehended that what is essential to a subaltern is to get access to education. It can open new avenues to surmount social discrimination and economic challenges.

Conclusion:

Bama's life journey from an ordinary woman to a literary person exhibits how position can be made. She has created her own identity. Through literary expression, Bama makes the whole world aware of the strengths and weaknesses of Dalit women, all facets of their lives and their expectations from society. Plenty of readers' responses, scholars' research and social changes about caste, class and gender are signs of the subaltern voices being heard. This approach of Bama acts like a powerful medium or agent to address the problems of Dalit women.

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