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Letter No: DSC/SR/JR/ Date: 29th May, 2023

CERTIFICATE

This is to certify that, the Number of research papers published per teacher in the Journals notified on UGC website during the last five years under Criterion-III (3.3.1) are as follows:

Sr. No.	Year	Number of research papers published			
		UGC Listed	Scopus	Web of Science	Total
1.	2021-22	01	01	Nil	02
2.	2020-21	02	04	01	07
3.	2019-20	01	02	Nil	03
4.	2018-19	04	Nil	Nil	04
5.	2017-18	03	02	Nil	05
	TOTAL	11	09	01	21

AKHILESH VASANTRAO PESHWE
Digitally signed by AKHILESH VASANTRAO PESHWE
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NAAC ACCREDITED GRADE 'A' WITH CGPA 3.01 (Third Cycle)

CRITERION-III

Research, Innovations and Extension

YEAR-1
2021-22

3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2021-22

SSR: 2023 FOR NAAC FOURTH CYCLE

DHARAMPETH M. P. DEO MEMORIAL SCIENCE COLLEGE, NAGPUR

3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2021-22

List of Research Papers

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Journal Status
1.	Effect of Na Glass Dispersion on Ionic and Electronic Transference in Ag2SO4.	Jasmirkaur Randhawa & **Prashant Ambekar**	PHYSICS	Vidya Bharati International Interdisciplinary Research Journal,	2319-4979.	UGC Listed
2.	Surface Conductivity of Binary Carbonate as a Performance Governing Parameter of an Electrochemical CO2 Gas Sensor	**Prashant Ambekar** and Jasmirkaur Randhawa	PHYSICS	Bulletin of Materials Science	3. 0973-7669	Scopus Indexed

Note: the links of each paper are incorporated in the template

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EFFECT OF NA-GLASS DISPERSION ON IONIC AND ELECTRONIC TRANSFERENCE IN Ag_2SO_4

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ABSTRACT

In the present study composite electrolytes of Ag_2SO_4 were prepared by dispersing high T_g Na-glass in different compositions. Formation of glass and composite was confirmed by powder X-ray diffraction study. Ionic and electronic conductivity measurements were carried out using Complex Impedance Spectroscopy and Wagner's dc polarization technique respectively. Nyquist plot reveals two different conduction mechanisms in the composite Ag_2SO_4+glass for all composition. Two orders of enhancement in ionic conductivity were observed at lower temperatures. The phase transition temperature of Ag_2SO_4 is found shifting to lower temperature side on increasing dispersoid concentration. DC conductivity study revealed that for pure Ag_2SO_4, $\sigma_{ion} > \sigma_{ele}$ and the electronic conduction is via both electrons and electron-holes, in agreement with earlier reported data. Electron-hole transference number is found more than the electron transference number indicating domination of p-type conductivity in pure phase. On the contrary Ag_2SO_4+glass composite showed n-type electronic conductivity. For a SO_2 gas sensor with cell configuration: $Ar,O_2,SO_2,Pt/Ag_2SO_4/Ag$(sealed); at high silver potential, silver ions are incorporated into the lattice of electrolyte and for neutrality reasons, the concentration of excess of electrons (e') in solid is increased. Performance of a typical SO_2 gas sensor is discussed in light of above conductivity results.

Keywords: *Composite, Electrochemical Gas Sensor, Electronic Conductivity, Solid Electrolyte, Wagner's DC polarization technique*

1. Introduction

With the advancement of nanotechnology major thrust is being given on development of solid-state gas sensors (semiconductor type) for their fast response and miniaturized dimensions. Yet a reliable SO_2 gas sensor with high selectivity is to be developed (Beatty et al, 2014; Hunter et al, 2020). Electrochemical gas sensors overcome the major disadvantages associated with solid state sensors, as they are highly selective and follows a theoretical relation which obviates the need of calibration. In the present study effect of electronic conductivity of the electrolyte on performance of an electrochemical SO_2 gas sensor is studied.

The electrochemical devices viz., batteries, fuel cells, sensors, super-capacitors *etc*. use solid electrolyte as a prime component. The electrolyte should possess fast ionic transference with negligibly small electronic conductivity. Enhancement in ionic conductivity of solid electrolyte is obtained either by iso/aliovalent doping, making solid solution or composites. The first crystal-crystal composite solid electrolyte has been obtained with sub-micron size alumina particles dispersed in Lithium Iodide matrix, exhibiting 50 times higher Li-ion conductivity at room temperature in relation to the host (Liang, 1973). Since then, a large number of composite solid electrolyte have been reported by dispersion of insulating phase e.g. α,β,γ-Al_2O_3, SiO_2, α-Fe_2O_3, MgO, Fly-ash, ZrO_2 into pure solid ionic conductor viz. LiBr, LiCl, CuCl, AgI, HgI_2, CaF_2, AgCl, Li_2SO_4, Ag_2SO_4, Na_2CO_3, glasses *etc*. Composites are preferred for device applications due to their inherently advantageous characteristic properties such as high ionic conductivity at relatively low temperatures, homogeneity in electrical and mechanical properties, better interface with electrode/s, enhanced electrode kinetics and stable thermal properties.

Ag_2SO_4 is an apt candidate for electrolyte/test electrode application in an electrochemical SO_2 gas sensor due to various advantages viz. high ionic conductivity with low activation enthalpy, non-hygroscopic nature, coexistence of Ag-Ag_2SO_4 as an equilibrium phase, better sinter ability etc. (Singh and Bhoga, 1999). The major disadvantage associated with pure phase sulfate-based electrolyte system is its very poor mechanical strength, porosity and instability over thermal cycling. The SO_2 sensors have Ag+Ag_2SO_4 as reference electrode. This reference electrode needs

Bull. Mater. Sci. (2021)44:235
https://doi.org/10.1007/s12034-021-02526-y

Surface conductivity of binary carbonate as a performance-governing parameter of an electrochemical CO_2 gas sensor

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MS received 2 February 2021; accepted 27 June 2021

Abstract. In electrochemical CO_2 gas sensor, the chemical potential of electrolyte changes on adsorption of CO_2 molecules as the process involves catalytic electron transfer. In addition, it is the rate-determining step that decides sensor's response. In this study, *in-situ* bulk AC, DC and surface electronic conductivities of $CaCO_3 + Li_2CO_3$ binary solid electrolyte were investigated at different temperatures and CO_2 gas partial pressures using complex impedance spectroscopy, Wagner's DC polarization technique and four-probe method, respectively. For the four-probe conductivity measurements with crucial requirement of high temperatures and test gas variations, a customized sample holder was designed and fabricated having gold-plated equidistant, spring-loaded electrodes and localized heating system (maximum 593 K). The AC bulk conductivity was found to decrease with rise in CO_2 gas concentration (from 0.1 to 100%) by about two orders and one order of magnitudes at lower and higher temperatures, respectively. Similarly, surface conductivity variation with temperature also showed Arrhenius behaviour for both the concentrations of CO_2 viz. 0.04 and 10%, giving lower value of activation enthalpy for lower CO_2 concentration. The surface conductivity change in the presence of different concentrations of CO_2 gas is justified by comparing with AC bulk conductivity measurements at different CO_2 partial pressures and DC conductivity along with sensing response. The mechanism is explained using activated charge transfer data. The range of E_a values on adsorption of CO_2 gas was found to be in the electronic excitation window, suggesting involvement of a new parameter to be investigated for non-Nernstian response of EC sensors.

Keywords. Charge transfer reaction; electrochemical CO_2 gas sensor; complex impedance spectroscopy; solid electrolyte; surface conductivity.

1. Introduction

Solid electrolyte is an important component of electrochemical gas sensor, which enables ions' transport through it under the electrochemical potential gradient between the opposite surfaces viz. test and reference electrodes. Ideally, this component is an ionic conductor with negligibly small electronic conductivity [1]. While sensing, on the adsorption of gas under test, its surface electronic conductivity may change as the process of gas adsorption involves catalytic electron transfer. This could be one of the rate-determining processes deciding the response time of sensor [2].

Gas sensors used in industry and in pollution monitoring systems should be reliable in terms of reproducibility, reversibility, fast response time, wide gas detection range, negligible cross-sensitivity, long-term operation, resistant to thermal shocks and follow theoretical laws such as Nernst's principle in case of electrochemical sensor. For electrochemical sensor fabrication, multi-component electrolyte systems are attractive owing to their better chemical stability and inherent high ionic conductivity compared to those of mono-component electrolyte [3]. The potentiometric CO_2 gas sensors based on mono-component electrolyte have been required to be operated at high temperature ($\sim$973 K) [4–6]. Also, highly hygroscopic nature of pure alkali carbonate Li_2CO_3, K_2CO_3, Na_2CO_3, etc. has restricted its use, as an electrolyte, in electrochemical detection of CO_2 gas under humid condition, since it drifts the cell's electromotive force (EMF) with time [7]. Addition of divalent carbonates to the pure mono-valent alkali carbonate, e.g., Li_2CO_3, enhances ionic conductivity and reduces cross-sensitivity to moisture [8]. Moreover, they provide good interface with reference electrode materials, which are generally tertiary oxides of alkali earth metals [6].

Potentiometric sensors developed using binary electrolytes have been found working better in terms of response time and sensitivity [2]. On comparing the characteristics of CO_2 sensors with different electrolytes, it has been observed that response time is strongly dependent on electrolyte's surface [2]. The variation of electrolyte

Published online: 26 August 2021

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CRITERION-III

Research, Innovations and Extension

YEAR-2
2020-21

3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2020-21

SSR: 2023 FOR NAAC FOURTH CYCLE

DHARAMPETH M. P. DEO MEMORIAL SCIENCE COLLEGE, NAGPUR

3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2020-21

List of Research Papers

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Journal Status
1.	Photoluminescence study of Ce3+ activated blue emitting Ca14Al10Zn6O35 lamp phosphors.	**Varsha Rangari**, V. R. Panse, Samiksha Dhoble and N.S. Dhoble.	ELECTRONICS	Journal of Physics: Conference Series	DOI 10.1088/1742-6596/1913/1/012035	Scopus Indexed
2.	Pali lexicography using lexonomy.	Anupama D. Sakhare, Arshad Shareef and **Varsha Rangari**	ELECTRONICS	Journal of Physics: Conference Series	DOI 10.1088/1742-6596/1913/1/012097	Scopus Indexed
3.	LRS BIANCHI TYPE-II BULK VISCOUS STRING COSMOLOGICAL MODEL IN BARBER'S SECOND SELF-CREATION THEORY	N. P. Gaikwad	MATHEMATICS	Vidyabharati International Interdisciplinary Research Journal	2319-4979	Web of Science
4.	Bulk Viscous Bianchi Type I Barotropic Fluid Cosmological Model With	N. P. Gaikwad	MATHEMATICS	Adv . Math . Sci . J	1857-8365 (printed);	Scopus Indexed

	Varying Λ And Functional Relation On Hubble Parameter In Rosen's Bimetric Gravity				1857-8438 (electronic)	
5.	ISSUES OF MOBILITY IN CLOUD COMPUTING ARCHITECTURE: A REVIEW	**Mrs. Snehal A.Narale**, Dr. P.K.Butey	COMPUTER SCIENCE	Journal of Emerging Technologies and Innovative Research (JETIR), Volume 7, Issue 8	2349-5162	UGC Listed
6.	Comparative study of vermicast generated from flower waste and leaf waste	**Dr Kirti Paturkar** sahil shambharkar Prasad Kulkarni	ZOOLOGY	Essence -International journal of environmental rehabilitation	0975-6272	UGC Listed
7.	Antibiotic Resilience Pattern and cetrimide induced ultra-structural changes Multidrug Resistance S.aureus.	**Archana Kulkarni**, Anuradha Deo, Seema Nimbarte.	MICROBIOLOGY	Journal of Critical Review, Vol 7, Issue 16 (1053-1065), 2020.	2394-5125	Scopus Indexed

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Photoluminescence study of Ce^{3+} activated blue emitting $Ca_{14}Al_{10}Zn_6O_{35}$ lamp phosphors

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Abstract. The photoluminescence analytical study of Ce^{3+} doped $Ca_{14}Al_{10}Zn_6O_{35}$ phosphors is done in this research work. Powder X-ray diffraction technique (XRD) along with scanning electron microscope i.e. (SEM), CIE colour coordinates including their PL properties with emission intensity effect too were analyzed for the characteristics of prepared phosphors. In the instance of $Ca_{14}Al_{10}Zn_6O_{35}:Ce^{3+}$, the emission spectra demonstrates an exclusive 442 nm centered band corresponding to Ce^{3+} 's 4f–5d transition. The result specifies that the Ce^{3+} activated $Ca_{14}Al_{10}Zn_6O_{35}$ phosphor could find out applications in the light phosphor production.

Keyword: - Photoluminescence, XRD, SEM, CIE,

1. Introduction

Synthetic alkaline rare earth aluminates enabled by Ce^{3+} ions are professional luminescence compounds, exhibiting a blue emission marked by excellent quantum output under UV excitation [1]. They are commonly used in PDPs, field emission displays (FEDs), and fluorescence lamps [2, 3]. The solid–state reaction process usually produces alkaline earth aluminate phosphors. Combustion synthesis is a new method introduced to the production of phosphor over the last few years [4]. Synthesis of the combustion involves an exothermic reaction among metal nitrates and a fuel. This method creates the as- synthesized state of strongly crystalline powders. Within this paper the specimen of the Ce^{3+} co-doped $Ca_{14}Al_{10}Zn_6O_{35}$ were synthesized through an easy process of combustion. We investigated their emission and excitation spectra, and identified a blue afterglow. The effectiveness in luminescence can be significantly improved when phosphors are doped with appropriate supplementary activators [5]. Owing to Ce^{3+} 's strong spectroscopic properties and its aptitude to integrate Ce^{3+} ion into a lot of unique host resources, Ce^{3+} enabled components have created increasing interest in a variety of applications. [6]. These all-prepared materials incorporate greater returns, emission wavelength with adequate reaction, rapid luminosity decreases in testing and stable temperatures, rendering them desirable for use in high energy branch of physics study [4] as well as in medicinal imaging applications [5]. On the basis of outstanding luminescence properties, inorganic activated Ce^{3+} materials are therefore used for ionizing radiation in displays, lighting systems and certain other applications. [7]. Ce^{3+} can be sustained in the oxidation state of a host material. The luminescence inquiries studied and checked the stability and incorporation of Ce ions into the sample. For the reason that positive spectroscopic property of Ce^{3+} also the potential to

Journal of Physics: Conference Series **1913** (2021) 012097 doi:10.1088/1742-6596/1913/1/012097

Pali lexicography using lexonomy

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Abstract. Lexonomy is a platform which is an open source for writing and publishing dictionaries. Pali Lexicography is actually a dictionary created by using Lexonomy, which is a web based tool for creating dictionaries. Since a dictionary is a means of understanding any language and its translation, the present work is about Pali Lexicography. It is a project that has been created using simple XML tags and technical skills without any cost. In this, word mapping is done using selected words that are chosen from the set of Pali Language which are also present in the Marathi Language set having almost similar meaning in Marathi Language. All the Pali words have their English meaning which are automatically sorted generating the Lexicographic order. Pali dictionary is created with a simple user interface and is easily operable.

1. Introduction

Lexonomy is an open source tool which is available for free facilitating to write and publish various dictionaries. It can be operated using a web browser where data storage is on the server rather than on a standalone computer. With the increase of technology across the globe, there are instances wherein a group of members working on some international project need to communicate using an interface that is understandable by everyone. For this, an interlinguistic tool can do the job. As of now, there are many monolinguistic and bilinguistic tools available but due to intervention of computational linguistics there is an essence for an interlinguistic tool. Keeping in view of the existing on-line digital dictionaries that can also solve the purpose, there is also a need to link these dictionaries to the lexicographic order that can certainly benefit the user in many ways.

For implementing this, we have taken the corpus from Pali language, some of the words which are also in the Marathi language having the similar meaning. Then mapping is done with the help of Pali words which have their English language meaning too and gets sorted automatically using the language constructs of translation. A user can view this with the help of a tool creating using XML and operate via a user interface.

1.1. Subentries

Lexonomy provides the option of subentries. That is, during the definition of entry schema, we can provide labels to few sections of the XML tree, for example we can make phraseological subentries, to be 'shareable', which can be shown into snippets of XML thus allowing it to get displayed in multiple entries at the same time. All the elements listed in this context shall be subentries by Lexonomy, and are shareable among several entries. Shareable subentries have a shaded background in the editing interface and are followed by a button which tells number of other entries, apart from the existing ones.

1.2. Headwords

This part allows to configure the headword list and its display. You can select the element which contains the entry's headword. If no selection is made then Lexonomy will be able to guess what the headword of each entry is. You can also adjust the order of the headwords in the entry list by specifying the element that should be used for sorting, e.g. part of speech and you can hard-code the alphabetical order that should be used for sorting.

LRS BIANCHI TYPE-II BULK VISCOUS STRING COSMOLOGICAL MODEL IN BARBER'S SECOND SELF-CREATION THEORY

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ABSTRACT

The LRS Bianchi type-II metric with stringviscous fluid have been evaluated by solving the barber's field equations of second self-creation theory of gravitation and studied the geometrical and physical aspects. The value of constant n $(n > 0)$ *affects the behavior of the model. The barber scalar function* ϕ *determines the nature of proper density* ρ*, particle density* ρ_p *and coefficient of bulk viscosity* ξ*. It is observed that our results are agreed with the result of Tyagi (2010) in the absence of barber scalar function* ϕ*.*

Keywords: *Gravitational theory, Cosmology, Self-Creation Cosmology*

Introduction

The role of Mach's principle in physics is discussed in relationto the equivalence principle. Brans and Dicke (1961)pointed out that as a consequence of a Mach's principle thevalue of gravitational constant should be determined by thematter in the universe and they have taken this concept asthe reason for generalizing the Einstein's theory of generalrelativity (GR) to the scalar-tensor theory of gravitation. In Bransand Dicke's (1961) scalar-tensor theory of gravitation, the tensor field is identified with the space-time ofRiemannian geometry and scalar field is alien to geometry.This theory does not allow the scalar field to interactwith fundamental principles and photons. However, Barber(1982) has modifiedBransand Dicke's(1961) scalar-tensor theoryto develop a continuous creation of matter in the large scalestructure of the universe and proposed two self-creation theories,out of which the first self-creation theory proposed by modifying Bransand Dicke theory (1961) but Brans (1987) has pointed out that the field equations of Barber's first self-creationtheories are not only in disagreement with experimentbut are actually inconsistence, in general and also this theory violetsthe equivalence principle andhence it discarded. The second self-creation (SSC) theory was proposed by Barber (1982) by modifying Einstein's theory of GR (1915)to a variable G-theory and predicts local effects withinthe observational limits. In modification of Einstein's GR, he attached the scalar function ϕ with the energy-momentum tensor on the right hand side of Einstein field equations in order to substantially accommodate the Mach's principle. So that the field equations in Barber's secondself-creation theory are

$$G_{ij} = \left(R_{ij} - \frac{1}{2} R g_{ij} \right) = -\frac{8\pi T_{ij}}{\phi} \qquad (1)$$

and the scalar field ϕ satisfies the equation

$$\Box\phi = \frac{8}{3}\pi\eta T \qquad (2)$$

where,$\Box\phi = \phi^{k}_{;k}$is the invariant d'Alembertian, ϕ is the Barber scalar function of $t$which is the inverse of Newtoniangravitational constant$G$ in GR, T is the stress of energy momentum tensorT_{ij}, G_{ij} is an Einstein tensor, η is the coupling constant with $0 \leq |\eta| \leq 10^{-1}$.

This SSCtheory is a variable G-theory and predicts local effects, which are within the observational limits. In it, the Newtonian gravitational parameter G is not a constant but a function of time parameter t. Also the scalar field ϕ does not gravitate directly but simply divides the matter tensor acting as a reciprocal

ADV MATH SCI JOURNAL
Advances in Mathematics: Scientific Journal **10** (2021), no.5, 2515–2525
ISSN: 1857-8365 (printed); 1857-8438 (electronic)
https://doi.org/10.37418/amsj.10.5.16

BULK VISCOUS BIANCHI TYPE I BAROTROPIC FLUID COSMOLOGICAL MODEL WITH VARYING Λ AND FUNCTIONAL RELATION ON HUBBLE PARAMETER IN ROSEN'S BIMETRIC GRAVITY

N.P. Gaikwad[1], P.V. Lepse, Binaya K. Bishi, and N.K. Ashtankar

ABSTRACT. We have deduced that bulk viscous Bianchi type I barotropic fluid cosmological model with varying Λ and functional relation on hubble parameter by solving the field equations bimetric theory of gravitation. It is observed that our model has exponentially accelerating expansion at late time starting with decelerating expansion which agreed the observation of Perlmutter (1998), Knop (2003), Tegmark (2004) and Spergel (2006). In the beginning, our model has more than three spatial-dimensions then it switched over to three-dimensional spatial geometry at late epoch of time and it is agreed with Borkar et al. (2013). Other geometrical and physical behavior of the model have been studied.

1. INTRODUCTION

It is well known that the cosmological models based on General Relativity contain an initial singular state (the big bang) from which the universe expands. This singular state can be avoided if the behavior of matter and radiation is described by the quantum theory. Unfortunately, nobody has given a way to do this satisfactorily. A satisfactory physical theory should be free from singularities

[1]*corresponding author*

2020 *Mathematics Subject Classification.* 83C20,83F05.

Key words and phrases. Barotropic Fluid, Bulk Viscosity, Rosen's Bimetric Gravity.

Submitted: 06.03.2021; *Accepted:* 29.03.2021; *Published:* 12.05.2021.

ISSUES OF MOBILITY IN CLOUD COMPUTING ARCHITECTURE: A REVIEW

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Abstract : Cloud computing is a technology which follows distributed computing approach in which resources and services are available under one umbrella in a single huge computational power/entity. Customers can access their applications from cloud data center from anywhere i.e. location independently. The resources are dynamically provided to the customers as pay on basis of their request over the internet or middleware. A cloud provider helps to transfer data from one data center to another. Usually cloud servers don't work at full ability means there's some power of processing data will be wasted. To use this wasted power in proper format it's possible to use the feature of mobility which can be able to move, migrate or relocate data, application software's among cloud data center server. In this paper author discussed, presented and suggested an architecture that can deal with the mobility feature with its issues in the cloud environment with respect to data migration. This paper makes a glance on the other issue of cloud architecture like energy consumption.

Keywords: Cloud Computing, Mobility, Data Migration and Techniques, Cloud architecture.

I. INTRODUCTION

Cloud computing is a model for facilitate network on demand from anywhere conveniently access to share pool of configurable computing resources like network, server, storage, applications and services [1]. Cloud computing technology has potential to enhance collaboration, agility, availability, scaling and provide many opportunities for cost reduction through different optimization and effective computing technology. Cloud Computing is the familiar catchphrase in today's Information Technology world. Cloud computing platforms are rapidly capable that were used for deploying different applications in many contexts [2]. The cloud is discriminating from the other traditional technology as it has infinite amount of capacity related to resources that are offered by cloud platforms with very competitive rate (e.g. CPU, storage, Network, infrastructure). With this advantage of resource capacity use of cloud computing help to eliminate the necessity for the installation of infrastructure requires for computing takes several months. Many of the Start-up Companies does not want to invest on the infrastructure because the resources are available in the cloud [3,4].

Cloud computing supports distributed computing approach so the resources are dynamically provided to the customers/consumers as per their requirement as pay on basis over the middleware or internet. A cloud provider provides services to the customers. It also helps to transfer or switch the data from one cloud to another cloud of data centre. While transferring the data between one cloud to another cloud, many challenges has to faced one of it is data migration issue and response time. In cloud data centres most of the servers has not work with full of its capacity means some time there is some power of processing of data would be wasted. To use this wasted power in proper format it's possible to use the feature of mobility which can be able to move, migrate or relocate data, application software's among cloud data center server. In this research paper author studied the issues of mobility in cloud architecture like data migration. Along with this data migration other issues of the architecture mainly energy consumption is discussed.

1. Cloud Computing System

The cloud computing system is build up with various components like service models (IaaS,PaaS and SaaS) and Delivery Models like (Public,Private,Hybrid and Community)[5]. Cloud computing systems provides all the resources at one place and satisfy the users request as per their requirement .Request from a user base need to be routed to a data center, where it can get serviced from different cloud like private to public or vice a versa. The process has been decided the efficiency with respect to response time, data center processing time and cost. Service broker policy plays an important role in achieving these parameters with efficient values [6]. Here are three service broker policies which are used in the proposed architecture to check the availability of the data center.

a. CDC
b. ORT
c. RDR with LB

International Journal for Environmental Rehabilitation and Conservation

ISSN: 0975 6272
XI (SP2): 38 — 41
www.essence-journal.com

Original Research Article

Comparative study of vermi-cast generated from flower waste and leaf waste

Paturkar, Kirti; Kulkarni, Prasad and Shambharkar, Sahil

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A R T I C L E I N F O

Received: 28 July 2020 | Accepted: 15 August 2020 | Published Online: 30 September 2020
EOI: 10.11208/essence.20.11.SP2.125

A B S T R A C T

This study evaluates concentration of essential elements (Mg, N, S, P, Ca, Zn, Fe, K, Organic carbon, C:N ratio) for plant growth present in the vermi-cast generated from flower waste and leaf waste. The flower waste from holy places and leaf waste from college yard was collected separately and cast generated from these waste analysed for the comparative study of different trace elements in cast generated from flower and leaf waste using IS and APHA method. Out of all the detected element N, the essential element for plants was found in high concentration in cast generated from flower waste(134.6mg/L) than in leaf waste cast (86.16 mg/L) while potassium(108.30mg/L)and zinc(415mg/L) is in higher concentration in leaf waste cast than the flower waste cast (potassium94.33mg/L, Zinc2.805mg/L).This implies cast generated from flower waste and leaves waste separately will be beneficial in overcoming deficiencies of particular essential element in plants.

K E Y W O R D S

Vermi-cast | Essential elements | Flower waste | Leaf waste | Deficiencies

C I T A T I O N

Paturkar, Kirti; Kulkarni, Prasad and Shambharkar, Sahil (2020): Comparative study of vermi-cast generated from flower waste and leaf waste. ESSENCE Int. J. Env. Rehab. Conserv. XI (SP2): 38 — 41. https://eoi.citefactor.org/10.11208/essence.20.11.SP2.125

JOURNAL OF CRITICAL REVIEWS

ISSN- 2394-5125 VOL 7, ISSUE 16, 2020

ANTIBIOTIC RESILIENCE PATTERN AND CETRIMIDE INDUCED ULTRA STRUCTURAL CHANGES IN MULTIDRUG RESISTANT *S. AUREUS*

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Received: 16 March 2020 Revised and Accepted: 17 June 2020

ABSTRACT: The emergence of resistance to antimicrobial agents is a global public health problem, particularly in pathogens causing nosocomial infections. The most common nosocomial pathogens include *Staphylococci* (especially *Staphylococcus aureus*), *Pseudomonas, Escherichia coli, Klebsiella* and *Proteus.* Concerns about resistance have led to not only the correct and judicious use of antibiotics but also more stringent infection control measures to reduce the transmission of infection because the organisms that cause nosocomial infections are often drug-resistant.. One such measure encouraged is the use of different disinfectants. QACs (Quaternary ammonium compounds) are the most useful antiseptics and disinfectants used in hospitals. Cetrimide is one such strong monocationic surfactant, a QAC. In the present study >50% *S.aureus* isolates collected from hospital environment showed resistance to antibiotics, such as teicoplanin(100%) erythromycin(50%), tetracycline (60%) cephalothin(40%), methicillin (40%), rifampicin(40%) and co-trimoxazole (10%). The MIC of cetrimide against these resistant *Staphylococcus aureus* varied between 9.765 and 312.5 mcg/ml with maximum number of isolates (30 %) showing the MIC value of 312.5 mcg/ml. The bactericidal activity of cetrimide against *S.aureus* evaluated by time kill assay indicated a complete killing of bacteria after 30min. Transmission electron microscopic studies on the effect of cetrimide on methicillin resistant *Staphylococcus aureus* revealed that the nuclear areas become obscured by an inflow of the cytoplasm, followed by loss of granularity of cytoplasm, disintegration of cell wall, cell membrane and condensation of cytoplasm, loss of cell constituents and break down of cell wall and extensive damage to cytoplasmic membrane and ultimately cell lysis. The ultra structural studies showed that antibiotic resistance does not alter the susceptibility of antibiotic resistant *S.aureus* to QAC cetrimide.

KEYWORDS: QAC, cetrimide, *S.aureus*, time kill assay, bactericidal.

1. INTRODUCTION:

The past few decades have seen an alarming increase in the prevalence of resistant microbial pathogens in serious infections. In USA, for instance, 50-60% of >2 million nosocomial infections are caused by antibiotic resistant pathogens (Jones, 2001). The prevalence of antibiotic resistant pathogens isolated in the intensive care unit (ICU) setting may be significantly higher than in other hospitals wards (Weber *et al.*, 1999). Infections caused by resistant pathogens represent an important source of morbidity, mortality and increased costs. (Weber *et al.*, 1999; Weinstein, 1998).

In 2003, a review of data from surveillance studies revealed a rise in antibiotic resistance in both Gram-positive and Gram-negative pathogens (Clark *et al.*, 2003).Among Gram-positive bacteria, *Staphylococcus aureus*, coagulase-negative *Staphylococci* and *Enterococci* are some of the commonest pathogens infecting patients in the ICU, but more disturbing is the pattern of antibiotic resistance in these pathogens. The appearance of vancomycin- resistant *S. aureus* (VRSA) in the ICU and methicillin-resistant *S. aureus* (MRSA) in the community, in addition to a rise in the incidence of vancomycin-resistant *Enterococci* (VRE), are of great concern. Antibiotic resistance among nosocomial pathogens is a growing problem and requires prudent use of antibiotics and a multidisciplinary approach.

Concerns about resistance have led to calls for increased education, of both public and professionals, on the correct use of antibiotics. Additionally, more stringent infection control measures have been advocated in order to reduce the transmission of infection (Anon, 1998; Cristino, 1999; Dixon, 2000; Smith, 1999). One such measure encouraged use of different disinfectants. Chemical disinfections are accomplished when an infectious material is doused with an appropriate amount of a disinfectant. Numerous disinfectants (Russell, 2002; McDonnell and Russell, 1999) have been used for microbial control of different pathogens.

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CRITERION-III

Research, Innovations and Extension

YEAR-3
2019-20

3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2019-20

SSR: 2023 FOR NAAC FOURTH CYCLE

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3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2019-20

List of Research Papers

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Journal Status
1.	LRS Bianchi Type I String Fluid Bulk Viscous Magnetized Cosmological Model in Rosen's Gravity	N. P. Gaikwad	MATHEMATICS	Journal of Xidian Univesity	1001-2400	Scopus Indexed
2.	Plant Essential Oils Based Nanoemulsion Formulations and Its Antibacterial Effect on Some Pathogens	Vaishali V. Pimple, **Archana S. Kulkarni,** Suvarna P. Patil, Sanjay J. Dhoble	MICROBIOLOGY	International Journal of Innovative Technology and Exploring Engineering (IJITEE) , ISSN :2278-3075 ,Volume-9 Issue-1 (4800-4808), November 2019	2278-3075	Scopus Indexed
3.	Investigating Potential of Plant Essential Oils as a Substitute for Antibiotic Addition in the Poultry Feed	S. Nimbarte, **Archana Kulkarni**, S Patil	MICROBIOLOGY	International Journal of Advance and Innovative Research, Volume 6, Issue 2 (II) (372-376), April - June, 2019, (UGC Journal No. 63571)	2394-7780	UGC Listed

Note: the links of each paper are incorporated in the template

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LRS BIANCHI TYPE I STRING FLUID BULK VISCOUS MAGNETIZED COSMOLOGICAL MODEL IN ROSEN'S GRAVITY

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ABSTRACT

We have investigated the string fluid cosmological model with magnetic field, in the presence and in the absence of bulk viscosity, in bimetric theory of gravitation. It is seen that our model has volumetric exponential expansion. All the parameters $\rho, p, \rho_p, \lambda, \theta$ and σ of the model are governed by the factor β only. If β is zero, then all these parameters vanishes. It is noticed that our model is exponentially expanding with accelerating expansion, which supports the recent observational data of Perlmutter et al.(1998), Knop et al.(2003), Tegmark et al.(2004) and Spergel et al.(2006). Other geometrical and physical aspects of the model also have been studied, in the presence and in the absence of bulk viscosity ξ.

Keywords-: Gravitation, Electromagnetic field, String theory, Bulk Viscosity, Cosmology.

1. INTRODUCTION

The large scale distribution of galaxies in our universe shows that the matter distribution is satisfactorily described by perfect fluid. However, in the universe, when neutrino decoupling occurred then the matter behaved like viscous fluid in early stage of universe. It is interesting to find out, how the cosmological solution in gravitation theory behave after introducing the viscosity term. The viscosity theory of relativistic fluids was first suggested by Eckart [1] and Landau and Lifshitz [2]. In isotropic and homogeneous cosmologies, dissipative processes can be modeled as a bulk viscosity within a thermodynamical approach. In the simplest cosmological models, there is no way to study entropy producing processes except through bulk viscosity. Thus, bulk viscosity arises any time a fluid expands rapidly and ceases to be in thermodynamic equilibrium. Bulk viscosity, therefore, is a measure of the pressure required to restore equilibrium to a compressed form of

Plant Essential Oils Based Nanoemulsion Formulations and Its Antibacterial Effect on Some Pathogens

Vaishali V. Pimple, Archana S. Kulkarni, Suvarna P. Patil, Sanjay J. Dhoble

Abstract: ***Antibiotic resistance is the most challenging problem of concern globally and this is invigorating the need of newer antimicrobial products with potential antimicrobial properties. Plant products, especially plant essential oils produce a large array of secondary metabolites as natural antimicrobials. Use of nanotechnology can add advantages to enhance the antibacterial properties of these essential oils. Present study is focused on development of nanoemulsions from plant essential oils and to study their antibacterial activities. Tea Tree Oil, Thyme Oil, Clove leaf and Cinnamon Essential Oils nanoemulsion was formulated using Tween 20 and Tween 80 respectively using probe ultrasonicator. All the formulated Nanoemulsions were then subjected to physicochemical characterization, stability studies and tested for antibacterial activities using Agar-well diffusion method. Stable nanoemulsion formulation with maximum antibacterial activity then subjected to droplet size measurements and polydispersibility index study. Increase in surfactant concentration resulted in reduction in droplet size when ultrasonication time was constant. Cinnamon oil nanoemulsion 20C4 & 80C4 with pdi index 0.573 and 0.382 and droplet size 272.3nm and 133.6 nm respectively demonstrated maximum antibacterial activity in Agar-well diffusion method against S.aureus, E.coli, and S.typhi. When both nanoemulsions were exposed to bacterial growth curve inhibition study. No potential rise in optical density of test pathogens were observed. The inhibition of bacterial growth may be due to killing action of cinnamon oil nanoemulsion formulations to initial bacterial inoculum added to nutrient broth. The study suggests that nanoemulsion formulations from plant essential oils can be used as natural antimicrobials in variety of products.***

Keywords: Agar-well, Bacterial growth inhibition, Droplet size, Essential Oils, Nanoemulsion, polydispersibility index, Tween 20, Tween80, Ultrasonication

I. INTRODUCTION

Microorganisms contribute one of the essential components of the earth and existed on it for more than 3.8 billion years exhibiting great genetic and metabolic diversity, contributing in maintenance and sustainability of ecosystem and also are causative agents of dreadful infections in humans, animals and plants. These microorganisms have evolved several mechanisms to tolerate selective pressures exerted by various environments and competitive challenges. One of these mechanisms is resistance to antibiotics. In recent times microorganisms evolved the genetic ability to develop and transmit resistance to antibiotics leading to inefficacy of these agents in treatment making use of these antimicrobial agents uncertain from future prospective. [1] Researchers are now warning of a return of pre-antibiotic era; with recent database listing existence of more than 2000 potential resistance |(r-genes) of nearly 400 different types from available bacterial genome sequences. [2] Therefore it is the need of an hour to limit the use of chemical antimicrobial agents and to focus on newer drugs, or formulations of either synthetic or natural origin which can be efficiently used to control microbial population. Despite of all the advancements in area of pharmaceutical chemistry and biotechnology, still plants are used sources of numerous phytomedicines with potential applications in treatment of infectious diseases and ailments. Thousands of different plant species have proven medical importance and these characteristics can be attributed synthesis of limitless phytochemicals with potential antimicrobial activity through specialized metabolic pathways that occur in them. [3] Different parts of the medicinal plants contribute to its medicinal properties, including leaves, stems, barks , fruit ,seed flowers, seeds, rhizomes, tubers, gums, resins and most importantly Essential Oils. Essential oils are normally volatile, rarely colored lipids constituting terepenoids, phenol-derived compound synthesized by many parts of the plants.[4] Present study focuses on use four different Essential Oil which are Tea tree oil, Thyme Oil, Clove leaf Oil & Cinnamon Bark oil. Tea tree Oil is derived from plant -*Melaleuca alternifolia* of native Australian origin. Terpene hydrocarbons mainly monpoterpenes, sesquiterpenes and their associated alcohols contributes to its biological activity.[5] Thyme oil is extracted and distilled form *Thymus vulgaris(L. Lamiaceae)* native to Mediterranean region of Europe, constituting infusions of monpoterpenes, with natural terpenoid thymol and its phenol isomercarvacrol(CVL)showingantitussive,expectorant,antis-pasmodic & antibacterial activities.[6]-14].Clove *(Syzygium aromaticum)* belongs to family Myrtceae. Clove Essential Oil finds application in treatment of acne, asthma rheumatoid arthritis and warts. [15] Cinnamon bark Oil is derived from *Cinnamomum zeylanicum*,(family-Lauraceae) and constitutes Cinnamaldehyde (3-phenyl-2-propanol) contributing it its antioxidant, antimicrobial and antiseptic uses.[16] Nano science and nanotechnology are nothing but science and engineering applied on nanometer scale of 10^{-9} meters. From last two

Revised Manuscript Received on November 08, 2019.

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International Journal of Advance and Innovative Research
Volume 6, Issue 2 (II): April - June, 2019
ISSN 2394 - 7780

INVESTIGATING POTENTIAL OF PLANT ESSENTIAL OILS AS A SUBSTITUTE FOR ANTIBIOTIC ADDITION IN THE POULTRY FEED

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ABSTRACT
The ancient knowledge pertaining to the ethno botanical aspects is known to be an important link in the successful evolution of mankind. This knowledge has provided various ways and means regarding the uses of plant wealth (various parts and their forms) that can be utilized in overall health related development of the humans. Moreover, latest research looking at the newer solutions for various health related problems not only in the humans but also in the domesticated animals like poultry has generated a lot of interest in this field. In view of this current investigation was carried out to check the suitability of vegetal oils secreted by two important medicinal plants i.e. Melaleuca alternifolia (source of Tea tree oil) and Thymus vulgaris (source of Thyme oil) having antimicrobial activity as a substitute for commercially used antibiotics in the poultry feed. The poultry business is growing at a very fast speed as it offers one of the richest and cheap sources of protein to vast population in many countries including India. The study was carried out by following standard methods and the results obtained (regarding the utility of Thyme and Tea Tree oil as fortification agents instead of antibiotics) after the experiment were analysed using standard statistical analysis. On the basis of the study results it is evident that there was significant difference in the feed conversion after feeding the poultry birds for 6 weeks with treatment A (feed with only antibiotics), B (feed with only Tea tree oil 2 ml/Kg of feed) and C (feed with only Thyme oil 2 ml/Kg of feed). Also, it was evident that highest feed conversion was observed in the poultry birds fed for six weeks with addition of Thyme oil.

Keywords: Ethno botanical knowledge, poultry, vegetal oils, Melaleuca alternifolia (source of Tea tree oil), Thymus vulgaris (source of Thyme oil), Feed Conversion

1.0 INTRODUCTION

The ethno botanical knowledge is very ancient and dates to prehistoric times. It provides information regarding the traditional uses of plant wealth which can be utilized in integrated rural development in general. However, the recent advances in the scientific field have generated a lot of interest in their (traditionally used plants and plant materials) in newer areas. The ethno botanical studies throw light on certain unknown useful plants and new uses of many known plants which can be exploited for developing new sources for some plant products and agro based industries. In view of the above, the use of some plants in the poultry industry has been studied in this investigation.

Though this discipline has existed for ages, ethno botany emerged as a distinct academic branch of natural science in twentieth century. However, still its use on wider scale is not carried out so far and many areas like the poultry industry has not seen its use either. It is now almost universally recognized as the total direct or natural relationship between man and plants and it includes the use of plants by both tribals and non-tribals without any implication of primitive or developed societies. Today ethno botany has become an important and crucial area of research and development in resource management, sustainable utilization and conservation of biodiversity and socioeconomic development. Now the botanists, social scientists, anthropologists, the practitioners of indigenous medicines all over the world are engaged in the study of man-plant interactions in natural environment.

Since many centuries, thousands of wild plant species offer various significant economic, social and ecological values which are of fundamental importance for human well-being, livelihood development and ecosystem resilience to environmental change. In most societies and more especially in developing countries wild plants generate tremendous direct economic benefits being important source for significant marketed goods (food, medicinal plant, firewood, etc) as well as indirect high value for non-marketed services (biodiversity conservation, soil protection, water regulation, recreation possibilities). The traditional knowledge contains a great potential as a useful basis for introducing modern innovative approaches to sustainable development and management of natural resources, especially in the poultry business. This is important as this business is vital to meet the protein requirement of large section of the society. Hence, in view of the above, this study has been carried out to determine whether the fortification of feed by vegetal oils secreted by plants like *Melaleuca*

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CRITERION-III

Research, Innovations and Extension

YEAR-4

2018-19

3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2018-19

SSR: 2023 FOR NAAC FOURTH CYCLE

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3.3.1

Number of research papers published per teacher in the Journals notified on UGC website during the years 2018-19

List of Research Papers

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Journal Status
1.	Enhanced Quality of Service Parameters Help to Improve Performance of Hybrid Cloud Architecture	**Mrs. Snehal A.Narale**, Dr. P.K.Butey	COMPUTER SCIENCE	IOSR Journal of Engineering	(p) 2278-8719, (e) 2250-3021,	UGC Listed
2.	Performance Evaluation of Interoperability With respect To Data Migration and Energy Efficiency in Hybrid Cloud Architecture	**Mrs. Snehal A.Narale**, Dr. P.K.Butey	COMPUTER SCIENCE	An International Multidisciplinary Quarterly Research Journal	2277-5730,	UGC Listed
3.	Phyco-Remediation and effective technology for TDS removal from Water and waste water	Pravin Meshram, **Vaishali Meshram** , Savi Shende	CHEMISTRY	Research Directions Special issue page no 175-182 feb 2019	2321-5488	UGC Listed
4.	Use of vegetal oils in the poultry feed as infection control Agent.	Suwarna Patil, Seema Nimbarte, **Kulkarni. A**	MICROBIOLOGY	Special Issue- Research Directions UGC approved Journal No. 45489, UGC Sr. No. 1208 (189-193)	2321-5488	UGC Listed

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IOSR Journal of Engineering (IOSR JEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 06-11

Enhanced Quality of Service Parameters Help to Improve Performance of Hybrid Cloud Architecture

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Abstract: *Cloud computing is an emerging technology which has been used for business as well as for education purpose. Cloud computing technology has advantages like agility, flexibility, scalability and quality of service. Quality of service parameter plays an important role to improve the performance of the architecture. In cloud computing due to the increasing use of cloud services, the quality of service (QoS) of cloud computing has become an important and essential issue. To improve the performance of the architecture various parameters of quality like availability, response time, processing time and execution time would enhanced. The performance of hybrid cloud is better than public and private cloud because hybrid cloud always gives optimized results. In this research paper performance of the hybrid cloud architecture has been by enhancing QoS parameters. Hybrid cloud is modeled using at least one private and one public or community cloud. To transfer the data or to access some applications in hybrid cloud the important factor which was considered is availability of the DC. If more DC's are available for the users to send a request then availability would be high. If the availability is high then more number of users sent request to access applications and resources from cloud data centre. Availability and response time are the parameter of QoS which was considered in hybrid cloud architecture. Enhancement of this parameter would really assist to improve the architecture of cloud. This research paper focused on QoS parameters like which improve performance of the architecture.*

Keywords: *cloud computing, QoS, hybrid cloud architecture, Availability, Response time*

I. Introduction

Cloud computing is an emerging technology which has been used for business as well as for education purpose. Cloud computing technology has advantages like agility, flexibility, scalability and quality of service. To design cloud architecture various parameters has been considered to improve the performance of the architecture. Quality of service considered different parameters like availability, linearity, response time, processing time, throughput time and execution time. All these parameters are belonging to real time environment. Performance of cloud architecture has been improved using various parameters of quality of service. Data is access from cloud data center and cloud service providers provides different services to the customers/users as pay per use on basis. Sometime data /applications are transferred from one cloud to another cloud with platform independent.

In cloud computing, cloud service provider offers different services to the user according to their need with the help of service model (IaaS,PaaS and SaaS) and delivery model (private, public, hybrid and community). These model offers abstraction in each layer of cloud architecture. There were three standard service models which have been used in cloud computing architecture defined by NIST as IaaS (Infrastructure as a service), PaaS (Platform as a service) and SaaS(software as service)[1]. Service model provides an abstraction in the layer to form a stack. The working principal of these three models does not relate with each other. They could be working independently on SaaS model. User has been worked on physical machines as per their requirement to access infrastructural information.

In hybrid cloud architecture the cloud is modeled using at least one public and one private or community cloud. The major advantage of hybrid cloud is better availability and response time in optimized way as compared to simple public or private cloud. Hybrid itself means it's a combination of two and here it combines public and private with its characteristics like security of private cloud and accessibility of public cloud. As in private cloud the number of client accessing the service will be less so it will be able to carry out the operations on daily basis. Thus, combines the property of both public and private and forms a hybrid cloud [2].

A. QoS

The demand for highly scalable virtual environment has been increased rapidly. This demand has been provided by cloud computing as per the demand of the user. Customer works in real time environment different

16. Performance Evaluation of Interoperability With Respect To Data Migration and Energy Efficiency in Hybrid Cloud Architecture

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Abstract

Cloud computing is a computing model which provides different services and resources to the user with the help of cloud service providers and users can access resources from shared free pool cloud data centre. Some time user need to access the resources from another cloud with same platform with provider or different provider with minimum cost. The process of exchanging of information from one cloud to another cloud is called as interoperability. Interoperability is considered as one issue of mobility. When the data has been migrated interoperability need to be considered with respect to energy efficiency and migration of data. Cloud architecture consists of four different layers physical resources IaaS, PaaS and SaaS. Cloud computing has lots of advantages But still cloud computing have some limitations. In this research paper interoperability issue of cloud architecture has been studied using hybrid cloud architecture with respect to data migration and energy efficiency. Power models would help to reduce energy consumption when data has been transferred from one cloud to another. Hybrid cloud architecture gives optimized result for power consumption and migration. Performance evaluation of hybrid cloud is tested using cloud report simulator.

Keywords: Cloud Computing, Hybrid Cloud Architecture, Interoperability, Energy Consumption, Mobility.

Introduction

Cloud computing is an emerging technology which is used for business as well as in the field of education. Cloud providers provide the services to the customers/user as per their requirement with minimum cost. One of the major advantage of cloud is cost efficiency because in cloud computing there is no hardware and software cost required for installation. For real time

27

PHYCO-REMEDIATION AN EFFECTIVE TECHNOLOGY FOR TDS REMOVAL FROM WATER & WASTEWATER

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Abstract
Phyco-remediation refers to the technology of using algae for the remediation of wastes, predominantly in the treatment of wastewaters. The macro algae help to reduce nutrient load by reducing total dissolved solids (TDS) effectively. It increases dissolved oxygen levels thorough photosynthetic activity and keeps bacterial population under control. An experiment has been conducted by selecting two different macro algal species namely *Pithophora* and *Nitella* with respect to the study of reduction of TDS in the synthetic water. On 20th day the TDS reduction was 42% by *Pithophora & 38%* by *Nitella*. pH was slightly vary on 20th day. The results of the present investigations showed that both the algae are having potential effect to remove TDS from synthetic water. Moreover, the removal of TDS of the synthetic water was progressively increased at 5, 10, 15 and 20 days of phyco-remediation experiments using *Pithophora* and *Nitella* sp. Therefore, the phyco-remediation technique is to sequester the TDS along with other nutrients from wastewater need to be promoted in a large scale. Phyco-remediation is a cost-effective, eco-friendly and a safe process.
Keywords: Macro-algae, wastewater, *Nitella, Pithophora, Phyco-remediation*

1. Introduction

Many aquatic weeds are used to treat a variety of wastewater (Arivoli and Mohanraj, 2013).Several studies revealed the efficiency of the phytoremediation using Typha, *Thaliadealbata*, *Acoruscalamus*, *Zizanialatifolia*, and *Phalarisarundinacea* (Valipour et al., 2009, Valipour et al., 2011, Wang et al., 2012a, Wang et al., 2012b, Marchand et al., 2014). The selection of plant species is the important criteria for wastewater treatment. However, high TDS and metal containing wastewater needs stress tolerant plant (Calheiros et al., 2012).

The *Typha* sp is having novel role for wastewater purification, even for high TDS and pH. The effects of high TDS and heavy metal concentrations on the growth of *Typha* sp. have been studied (Manios et al., 2002, Manios et al., 2003, Macek and Rejmankova, 2007).
The aim of this study is to evaluate a phyco-remediation process by using two different types of algae and to determine the removal of TDS, treatment performance and the morphological characteristics through environmental aspects.

In the proposed studies it has been assessed that the treatment of synthetic water with reference to TDS removal by using algae. These assessments will allow us to explore better potential for using the constructed phyco-remediation by selecting appropriate macro-algal species under the variety of influence conditions as compared to conventional processes. In aquatic macrophytes the high TDS gets accumulated in tissues due to which the treatment is performed and tolerated by the plants (Shelef et al., 2013).

USE OF VEGETAL OILS IN THE POULTRY FEED AS INFECTION CONTROL AGENTS

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Abstract

The importance of poultry on the world stage is widely acknowledged as it is a basic source of protein. The poultry business is often marred with the various infections to the birds. This basically hampers the prospects of the business to grow sustainably. Hence, in view of this the poultry businessmen have made rampant use of antibiotics to control the menace of infections. This leads to development of antibiotic resistance amongst the common pathogens encountered in the poultry industry. Hence, in order to develop new techniques and means to prevent development of antibiotic resistance among the poultry pathogens, novel agents are needed. In view of the above, this study has been carried out to determine the potential of herbal Vegetal Oils as an antimicrobial agent, especially against the poultry pathogens. This is particularly very important as majority of poultry farms are operational in the rural areas where indiscriminate use of antibiotics is a real issue. In the backdrop of the above information, this study was carried out to assess the utility of vegetal oils (thyme oil and tea tree oil) as an antimicrobial agent for its possible use in the poultry feed. The study has been carried out by using standard procedures, wherein the birds (Indian broiler) were fed with feed fortified/treated with vegetal oils for a period of six weeks. The study results showed that the prevalence of infections in the poultry was significantly less, thereby indicating the effectiveness of these vegetal oils as antimicrobial agents. Moreover, the results also indicated that the birds gained substantial body weight during this time indicating that the addition of vegetal oils has not affected the health of birds.

Keywords: Poultry, infections, antibiotic resistance, pathogens, vegetal oils

Introduction

In order to have proper growth, egg production and good health, poultry birds require adequate amount of energy. Moreover, the growth is also a function of their overall health i.e. remaining infection free. Thus, in order to obtain desired growth rate, one needs a nutritious feed for the poultry along with its (feed's) ability to control the menace of infection. Hence, selection of poultry feed ingredients become very important and need adequate attention for sustainable development of this industry. Moreover, the other important problem faced by the poultry industry is the mortality of birds due to various infections that result in significant economic losses. Hence, the industry does need a dependable as well as potent agent to fight against this problem of infectious diseases.

Amongst all the medicinal plants, vegetal oils are one of the most active components that have varied usage. These compounds (vegetal oils) that are made up of variety of different volatile compounds (Hadizadeh et al., 2009) possess antimicrobial activity against

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NAAC ACCREDITED GRADE 'A' WITH CGPA 3.01 (Third Cycle)

CRITERION-III

Research, Innovations and Extension

YEAR-5
2017-18

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Number of research papers published per teacher in the Journals notified on UGC website during the years 2017-18

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List of Research Papers

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Journal Status
1.	Enzyme Function Prediction in the Hypothetical Proteins of Yersinia Pseudotuberculosis-Way To Link Pathway	Archana Kulkarni	MICROBIOLOGY	Trends in Life Sciences Vol. 7, Issue 3 (1-5), 2018, (UGC approved Journal No. 8226)	2319-4731	UGC Listed
2.	Exploring Innovative Approach to Combat multidrug resistant S.aureus	Abhishek Mokase, Arti Shanware, **Archana Kulkarni.**	MICROBIOLOGY	Journal of Pharmacy Research Vol.12, Issue 02 (194-199), 2018, (UGC approved Journal Sr.No 218)	0974-6943	UGC Listed
3.	High dose TL response of fly ash collected from coal fired thermal power plant	Swati Joshi, Karan Kumar Gupta, S.K. U bale, S.J. Dhoble	PHYSICS	Science Direct	1350-4487	Scopus Indexed
4.	Throttled load balancing scheduling policy assist to reduce grand total cost and data center processing time in cloud environment using cloud analyst	**Mrs.Snehal A.Narale**, Dr.P.K.Butey	COMPUTER SCIENCE	IEEE Xplore Digital Library	2168-7161,	Scopus Indexed

5.	Blowfish encryption algorithm facilitate to secure user data of hybrid cloud in cloud computing environment	**Mrs.Snehal A.Narale,** Dr.P.K.Butey	COMPUTER SCIENCE	Aayushi International Interdisciplinary Research Journal (AIIRJ)	2349-638x	UGC Listed

Note: the links of each paper are incorporated in the template 3.3.1

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ENZYME FUNCTION PREDICTION IN THE HYPOTHETICAL PROTEINS OF *YERSINIA PSEUDOTUBERCULOSIS* -WAY TO LINK NEW PATHWAY

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ABSTRACT

The pathogenicity of *Yersinia pseudotuberculosis* is increasing not only in animals but also among human. The genome sequence of it gives us detail insight about protein-coding ability and molecular analysis is also possible with many uncharacterized proteins marked on the genome. In the present study, hypothetical proteins encoded by the *Y. pseudotuberculosis* searched for the available conserved domain capable of encoding enzyme function once searched by servers like CDDBLAST, Interproscan, PFAM and CATH. The structure-function relation of enzyme coding hypothetical proteins determined by homology modelling to decipher the tertiary structure of a hypothetical protein using close sequence template available with RCSB PDB. In a result, 34 hypothetical proteins out of 759 proteins (Hypothetical) linked with enzyme function successfully with 100% confidence level. Among them, 15 hypothetical proteins structurally modelled that showcase structural homolog also. In a conclusive remark, hypothetical proteins of *Y. pseudotuberculosis* predicted to function like enzyme and demanded a further investigation by cloning and expression studies with ideal host as *E. coli* to confirm its metabolic function in *Y. pseudotuberculosis*.

KEYWORDS: Hypothetical protein, Conserved Domain, Bioinformatics, Homology Modelling

INTRODUCTION

As per the pathogenic link, the bacterium -*Yersinia pseudotuberculosis* reported being foodborne pathogen bringing about acute gastrointestinal illness (Kim *et al.*, 2018). The resultant gastrointestinal infection by the *Y. pseudotuberculosis* remains persistent and almost complicated that bring about relapsing enteritis and sometimes severe autoimmune disorders (Heine *et al.*, 2018). It is important to learn about the new protein-coding organism like *Y. pseudotuberculosis* expresses Rfalt that enhances transcription of the number of operons involved in lipopolysaccharide formation and that results in resistance towards antimicrobial chemokines and assures an increase in virulence (Hoffman *et al.*, 2017). Researchers also investigated in detail about genome arrangement of *Y. pseudotuberculosis*.

One such study carried out genome analysis of 134 strains of *Y. pseudotuberculosis* and used CRISPER in understanding evolutionary trajectory and protein-based functions (Seecharran *et al.*, 2017). Willcocks *et al.*, (2018) reported *Y. pseudotuberculosis* as the zoonotic pathogen, that can bring about gastrointestinal infection in human. Here they genome marked the gene ypt 3665 involved in peptide deformylase, that makes the organism sensitive towards actinonin, a deformylase inhibitor. This finding is put forward by close homolog study of other *Yersinia spp.* related successfully with divergence and homology of the species. (Will cocks *et al.*, 2018). Researcher An *et al.*, (2009) related one gene Ker V able to encode hypothetical methyltransferase and found to be highly conserved among the other genera such as *Burkholderia*, *Escherichia*, *Shigella*, *Vibrio*, and *Yersinia*. Garborm *et al.*, (2004) advocated linking novel virulence-associated genes once as hypothetical protein in *Yersinia* sp., *Helicobacter* sp., *Borrelia* sp., and *Streptococcus* sp.

Lastly, Schrimpe-Rutledge *et al.*, (2012) strongly recommended adopting the methodology for genome annotations especially while studying *Yersinia* species. The emphases on use of omics-based annotation methodology to link un-annotated genome of *Yersinia* species once taking the assistance of computational biology. The searching for function in hypothetical proteins along with virulence genes and likewise is strongly recommended.

In the present study, an attempt has been made to search enzyme function in the hypothetical proteins of *Y. pseudotuberculosis* by involving the bioinformatic approach. The structure-function relationship has also been established with several hypothetical proteins specially to get engage in enzyme activity.

Research Article

Exploring innovative approach to combat multiple drug resistance of *Staphylococcus aureus*

Abhishek Mokase[1], Arti Shanware[1]*, Archana Kulkarni[2]

ABSTRACT

Aim: Bacteriocins are ribosomally synthesized antimicrobial peptides which are active against bacteria either of same or closely related species. The protection against the pathogen using bacteriocin was considered as an innovative approach, especially against the multidrug-resistant bacteria. **Materials and Methods:** Human skin sample has been swabbed and inoculated on Mannitol salt agar to isolate *Staphylococcus epidermidis* and later on they have been identified by biochemically and by 16S rRNA gene sequencing. Cell-free bacteriocin produced by the *S. epidermidis* has been checked against the multidrug-resistant *Staphylococcus aureus* by well diffusion assay. **Result:** *S. epidermidis* SE2 identified by 16S rRNA gene sequencing found to be producing the bacteriocin which is inhibiting multiple drug resistant *S. aureus* with the 13 mm zone of inhibition proving its medical potential. **Conclusion:** Human skin possesses *S. epidermidis* having bacteriocin producing ability and that can also be used to control multidrug-resistant *S. aureus* and proving its potential in medical biotechnology.

KEY WORDS: Antibacterial activity, Bacteriocin, *Staphylococcus aureus*, *Staphylococcus epidermidis,* Well diffusion assay

INTRODUCTION

The human skin microflora is unique and multifaceted and is made up of mixture of diverse groups of microorganisms including aerobic, anaerobic, and facultative bacteria such as *Staphylococci* spp., fungi such as *Malassezia* spp., viruses, and bacteriophages.[1,2] Based on the metagenomic and cultural studies, it has been investigated that propionibacteria take over the sebaceous sites and *Staphylococci* mostly colonize moist areas of skin.[1-3]

Among the *Staphylococcus* spp., the species *Staphylococcus epidermidis* plays an important role in the skin microbiota. *S. epidermidis* is also known by synonyms: *S. epidermidis albus, Micrococcus epidermidis,* and *Albococcus epidermidis* as per taxonomy database and available at https://www.ncbi.nlm.nih.gov/Taxonomy.[4-6] The genome of *S. epidermidis* encodes protein using the genetic code translated as per translation Table 11.[7]

Access this article online	
Website: jprsolutions.info	**ISSN:** 0974-6943

Bacteriocins are becoming more popular due to its ability to kill bacteria and also reported in maintaining the target population number by reducing them through Bacteriocin specific activity. Unlike antibiotics which are secondary metabolites, bacteriocins are ribosomally synthesized proteins/peptides and sensitive to proteases, also being harmless to humans and linked environment, which makes it better candidate to investigate in detail.[8-10]

In the present study, the interaction of bacteriocin produced by *S. epidermidis* on the *Staphylococcus aureus* has been investigated with reference to growth inhibitory action. Keeping in a view, mechanism of bacteriocins, its purification and identification studies has been carried out during the present investigations.

MATERIALS AND METHODS

Isolation of *S. epidermidis*

To isolate the *S. epidermidis* from human skin samples, 10 subjects were taken into consideration and swabs were collected from hands and legs. The swabs were aseptically inoculated on the selective media mannitol salt agar and incubated at 37°C for 24 h to obtain

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Received on: 20-10-2017; Revised on: 25-11-2017; Accepted on: 21-12-2017

Radiation Measurements
Volume 105, October 2017, Pages 47-53

High dose TL response of fly ash collected from coal fired thermal power plant

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https://doi.org/10.1016/j.radmeas.2017.08.004
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Highlights

- The TL dose response of class F fly ash material has been investigated.
- They were examined to understand the radiation effect on their TL properties.
- Fly ash can be used for measurement of dose as high as 40 kGy.
- Trapping parameters of TL glow curve was calculated using different methods.

Abstract

In this present work we have reported the thermoluminescence properties of fly ash collected from Khaperkheda thermal power station, Nagpur, India. The behavior of the fly ash in powder form was investigated in a ^{60}Co gamma field, in order to verify if it can be used as a dosimeter. Fly ash was irradiated to different doses of γ-rays varying from 10 kGy to 60 kGy. The linear response was observed up to 40 kGy of irradiation. $T_m - T_{stop}$ method was used for the estimation of possible number of TL peaks present in glow curve of fly ash. The TL glow curve of fly ash was found to be consisting of four TL peaks at 141, 205, 285 and 347 °C respectively. Computerized glow curve deconvolution (CGCD) function was used for the deconvolution of TL glow curve to confirm the exact position of each peak present in the fly ash. Chen's peak shape method and initial rise method were used for the calculation of trapping parameters of observed glow peaks. The total lifetime of each glow peak was also calculated to show their stability at room temperature. The TL response of this fly ash may be considered to be satisfactory for applications in high-dose dosimetry.

Proceedings of the 2nd International Conference on Inventive Communication and Computational Technologies (ICICCT 2018)
IEEE Xplore Compliant - Part Number: CFP18BAC-ART; ISBN:978-1-5386-1974-2

THROTTLED LOAD BALANCING SCHEDULING POLICY ASSIST TO REDUCE GRAND TOTAL COST AND DATA CENTER PROCESSING TIME IN CLOUD ENVIRONMENT USING CLOUD ANALYST

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Abstract— Cloud Computing is computing technology in which the word cloud is defined as delivery of demand services and resources from user's application to cloud data center through internet connection as pay on demand. Cloud computing has face lots of challenges like security, data migration, work load management, data integrity, confidentiality and many more. In cloud computing, data is t on cloud data center and cloud service provider s provides data to the customer as per their requirement. Customers also access data from anywhere any place ubiquitously. In cloud computing load balancing technology is used to distribute workload for balancing load between two or more cloud server. Load balancing main aim is to optimize resource utilization, maintain cost of data center and virtual machine, maximize throughput, reduce response time and avoid overloading of load. The main objective of this research paper is to reduce data center transfer cost, total virtual machine cost, data center processing time and reduce response time using throttled load balancing policy with optimize response time service based policy. In this research paper researcher used cloud analyst simulator of cloudsim for simulation and modeling of data. This study has evaluated throttled load balancing and their optimization criteria like data center processing time and reduces cost. One more thing studied is this experiment has done for hybrid cloud by adding user bases from private and public cloud.

Index Terms— Cloud Computing, Cloud Analyst, Load Balancing, Cost, Data Center, VM,DCPT.

INTRODUCTION

Cloud computing is a delivery model in which services are delivered from application to data center over the internet. The resources are delivered to the customer as per their requirement though internet connection on a pay per use basis. The resources are utilized or access from data center. A cloud service provider provides different services to the customers. In cloud computing environment the cloud consist of three main components described as follows:

- Data center
- Client computer
- Distributed server

The definition of cloud computing provided by NIST says that cloud computing is a model that enabling convenient, on demand network access to a shared pool of configurable computing resources(network, server and services) that can be rapidly provisioned with minimal management effort or service provider interaction. So in cloud computing there is no need to stored data on desktop or laptop instead of that data can be stored on cloud data center. User/customer can access resources from cloud data center ubiquitously with location independently. The main objective of the cloud computing is to control the load over the network. Diverse load balancing scheduling algorithms are implemented in cloud computing to overcome the problem of workload distribution. Load balancing is defined as distribute the workload across several computing resources like network link, central processing link and disk drive [1]. The main objective of load balancing is to optimize resource utilization, reduce response time, maximum throughput, reduce data and virtual machine cost, avoid overloading of workload [2]. This research paper study reduce data center processing, data transfer cost and virtual machine cost in hybrid cloud approach. Hybrid cloud is nothing but integration of public and private cloud or community cloud. In this research paper the experimental work is done by adding /considering user bases from same region and different region of data center. If user bases are added in the same region of data center then it should be considered as private otherwise if user bases added in some different region then it should be considered as public cloud.

I. PROBLEM DEFINITION

In cloud analyst setup 8 user bases(UB1,UB2,UB3,UB4,UB5,UB6,UB7 & UB8) are consider for different regions(0,1,2,3,4,5). In this case three data centers with 0, 1, 2 region has consider. To achieve the aim of the load balancing policy like reduce data center processing time and cost using throttled load balancing policy along with this ORT service broker policy is consider. In this research paper a problem statement has to be defined as minimize response time by optimization of resource utilization ,processing time and reduce grand total cost(data transfer cost & virtual machine cost) by distribution of equal load to various data center .

II. LITERATURE REVIEW

Vibhore Tyagi, Tarun Kumar [1] mentions that main challenge of cloud computing is to reduced response time ,reduce cost and data Center processing time using throttled load balancing policy across VM's in multi data center and optimize response time service broker policy. The simulated result is evaluated using throttled load balancing policy and ORT service broker policy with their scheduling criteria like response time, reduce cost and data center processing time. The grand total cost is $20.64.

Kousik Dasgupta a, Brototi Mandal b, Paramartha Dutta c, Jyotsna Kumar Mondald, Santanu Dame [2] focused on , a genetic algorithm based load balancing strategy for Cloud Computing has been developed to provide an efficient utilization of resource in cloud environment. In this research paper the analysis of the results, designates that the proposed strategy for load balancing not only outperforms a few existing techniques but also guarantees the QoS requirement of customer job. It also mention about a very simple approach of GA has been used however variation of the crossover and selection strategies could be applied as a future work for getting more efficient and tuned results.

Aayushi International Interdisciplinary Research Journal (AIIRJ)
ISSN 2349-638x Impact Factor 4.574 Special Issue No. 26
UGC Approved Sr.No.64259 **Website :-** www.aiirjournal.com **Email id:-** aiirjpramod@gmail.com

BLOWFISH ENCRYPTION ALGORITHM FACILITATE TO SECURE USER DATA OF HYBRID CLOUD IN CLOUD COMPUTING ENVIRONMENT : A STUDY

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ABSTRACT

Cloud computing is a technology which offers different services (like network, server) to the users as you pay on basis. Cloud is free pool of resources [1,2]. Cloud computing has several advantages but apart from this it has to face challenges also. One of the major challenge of cloud computing is security. Security of data plays vital role in cloud computing environment. Data security assures various parameters like integrity of data, confidentiality of data and authentication of data [3]. Now a day's awareness and concern regards to cloud computing and information technology has growing. Most of the data system and processes used data security algorithms to protect cloud data[4]. Hybrid cloud is nothing but integration of two public or private clouds or public, private cloud independently. Resource sharing is one of the advantages of cloud computing while sharing data or transferring data from one cloud to another cloud due to overloading user always wants to security about his data. Symmetric and asymmetric algorithms are used for the security of the data. In this paper researcher presents brief overview on blowfish algorithm a type of symmetric algorithm which emphasis on security of user's data. Blowfish algorithm helps to reduce power consumption in cloud computing. There are various cryptography techniques like DES, Blowfish,RC5, AES, RSA, 3DES , Diffie-Hellman[6,7]. These techniques are used in protecting the data in those applications which are running in a network environment. One more thing should be discussed in this paper is how users data should be secure with minimum cost

Keywords: *Cloud Computing, Blowfish Algorithm, Cloud Security, Hybrid cloud*

INTRODUCTION

Cloud computing is a technology which offers various services to the users as per the requirement. It is not technology but it is a way of delivering computing resources based on the existing technologies like virtualization. Cloud computing is closely linked with IaaS, SaaS and PaaS as service model. It also recommended public, private, hybrid and community cloud ad deliver cloud . One of the benefit of the cloud computing is , it reduces cost of the hardware that have been used by the user at other end. Cloud is nothing but free pool of resources like hardware, software, network and server. As there is no need to install hardware and software at the users end because it is stored somewhere else at another location. Cloud computing assist to access the data from the data center ubiquitously from any location with location independently. Instead of buying the infrastructure or software to run the process and save the bulk of data they just buy as per user requirement on pay basis.

Cloud networks uses various services through minimum utilization of resources to get maximum output. Cloud technology provides a way which requires and utilizes its resources in the best way. [1]

Cloud computing has various advantages over traditional computing which include agility, cost reduction, location and device independency, scalability. Cloud computing has to face the challenge of data security and integrity of the data. Different models and algorithms are proposed to study security issues of the data. The scheme used in the model falls into two categories private and public auditability of the cloud. Private cloud is more efficient than public cloud in terms of security of users' data when data could be share from one cloud to another.

Hybrid cloud is one type of the type of delivery model of cloud computing. The term hybrid cloud is nothing but integration of private and public cloud or community cloud. Resource sharing and resource utilization is one of characteristics of cloud computing in which resources are shared as per users requirement. The process of sharing