

## Faculty Achievements

### Hearty Congratulations to Dr. Nalinakshi N



1. *Paper published in S Biointerface Research in Applied Chemistry (Q3) Nalinakshi N , , (2021) Effect of Variable Fluid Properties and Magneto Hydrodynamics for Convection with Couple Stress Fluid, Biointerface Research in Applied Chemistry, Volume 11, Issue 5, 2021, 13490 - 13501*
2. *Paper published in Springer Nalinakshi N , Thermo-Diffusion and Diffusion-Thermo Effects for a Forchheimer Model with MHD Over a Vertical Heated Plate, Advances in Fluid Dynamics pp 343-361*

Biointerface Research in Applied Chemistry  
Platinum Open Access Journal ISSN: 2069-5831

Article  
Volume 11, Issue 5, 2021, 13490 - 13501  
<https://doi.org/10.33263/BRIAC115.1349013501>

### Effect of Variable Fluid Properties and Magneto-Hydrodynamics for Convection with Couple Stress Fluid

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Received: 11.04.2021; Revised: 7.02.2021; Accepted: 9.02.2021; Published: 13.02.2021

**Abstract:** An attempt is made for analyzing MHD mixed convection over a vertical heated plate with a couple of stress fluid numerically in a systematic manner. Unlike other research-based on literature surveys, the fluid properties are varied here where convection improves drastically compared to fixing them constantly. The boundary layer flow is estimated through mathematically formulated equations for the physical configuration considered. These formulated equations are very tedious to solve with specified boundary conditions in nature. Similarity transformations, RK4 scheme, and NR method are used to convert those tedious non-linear PDE to higher-order ODE and hence to first order. Interpretation of various significant parameters is studied and observed their effects with momentum, energy, and solutal equations producing the fluid flow with the plotted graphs. The contribution of the Magnetic field is observed in velocity by reducing the force of the fluid flow. This work's main contribution is to see the effective convection with significant fluid flow parameters, with the inclusion variable fluid properties.  $Nu$  and  $Sh$  numbers are also computed. Certain added effects making them void are well suited and matched with researchers' previous works with a better agreement.

**Keywords:** heat and mass transfer; couple stress fluid; variable fluid properties; porous medium; MHD.

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#### 1. Introduction

The fluid flow behavior and its characteristics cannot be exactly described by the conventional non-polar fluids, which are Newtonian fluids. Hence, in the present era, the theory of polar fluids, which are non-Newtonian, takes special attention by many authors and scientists as they require for industrial processes like a solidification of liquid crystals, colloidal and suspension solutions, extrusion of polymer fluids, cooling of the metallic plate and exotic lubrications. Couple stress fluids, which own their distinct features like polar effects and having a magnitude of pressure rise very high, are one among the non-Newtonian fluids with their growing importance in recent technology and industries. The physiological process can happen with magnetic therapy, bearings, and many others. The former can be observed in generators, flow-meters, pumping liquid pumps with the presence of a magnetic field. The latter is the



[Advances in Fluid Dynamics](#) pp 343-361 | [Cite as](#)

### Thermo-Diffusion and Diffusion-Thermo Effects for a Forchheimer Model with MHD Over a Vertical Heated Plate

Authors: [Nalinakshi](#), [P. A. Dinesh](#)

N. Nalinakshi, P. A. Dinesh

Conference paper

First Online: 11 July 2020



Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

#### Abstract

Heat and mass transfer for a Forchheimer model of electrically conducting fluid with Soret and Dufour effects over a vertical heated plate is studied. The governing equations for the physical problem in consideration are highly coupled and nonlinear in nature. A shooting technique is applied to the first-order ODEs' which are obtained by using similarity transformations to PDEs' and then to higher-order ordinary differential equations. The effects of various non-dimensional significant parameters such as Richardson number, Prandtl number, magnetic parameter, Soret and Dufour parameters and so on are interpreted. Attenuation with the velocity of fluid flow occurs due to the cause of magnetic force. The diffusion effects which are crossed in the energy and solutal equation enhance the thermal effects. Skin friction, rate of heat, and mass transfer are also computed. Results obtained are compared with the existing work and found to be in good agreement.

#### Keywords

Heat and mass transfer; Soret and Dufour effects; Boundary layer; Porous medium; MHD

#### Nomenclature

$U_\infty$	Free stream velocity
$G$	Gravitational field
$T_\infty$	Uniform constant temperature
$C_\infty$	Uniform constant concentration
$T_{\infty 0}$	Ambient temperature
$C_{\infty 0}$	Ambient concentration
$u$	Velocity component along x-direction
$v$	Velocity component along y-direction
$\epsilon$	Porosity
$g$	Acceleration due to gravity
$p$	Pressure
$T$	Temperature of the fluid

## Hearty Congratulations to Dr. Venkatesh S



\* (Q3) Venkatesh Sadhana., Panicker, R. R., Lenin Kumar, V., Pavankumar, B. B., Viswanath, N., Singh, S., ... & Sivaramakrishna, A. (2020). Efficient catalytic transfer hydrogenation reactions of carbonyl compounds by Ni (II)-diphosphine complexes. *Journal of Coordination Chemistry*, 73(20-22), 2963-2977.

\* (Q2) Mathias, G. P., Panigrahi, T., Shanbagh, S., Venkatesh Sadhana., Babu, P., Rasikala, K., ... & Ghosh, A. (2020). Combination of Aqueous Extracts of *Phyllanthus niruri*, *Boerhavia diffusa*, and *Picrorhiza kurroa* Zingiber officinale alone Inhibit Intracellular Inflammatory Signaling Cascade. *Journal of Herbal Medicine*, 23, 100378

JOURNAL OF COORDINATION CHEMISTRY  
2020, VOL. 73, NOS. 20-22, 2963-2977  
<https://doi.org/10.1080/00958972.2020.1837784>



### Efficient catalytic transfer hydrogenation reactions of carbonyl compounds by Ni(II)-diphosphine complexes

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#### ABSTRACT

The catalytic transfer hydrogenation reactions of a series of aromatic and aliphatic carbonyl compounds were investigated using divalent Ni(II)-diphosphine complexes, [L<sub>2</sub>NiCl<sub>2</sub>] (where L<sub>2</sub> = 1,1-bis(diphenylphosphino)methane (dppm), 1,2-bis(diphenylphosphino)ethane (dppe), 1,3-bis(diphenylphosphino)propane (dppp), 1,1-bis(diphenylphosphino)ferrocene (dppf), and *N*-butyl-*N*-(diphenylphosphino)-1,1-diphenylphosphinamine (dppba)). This is a single-step reaction in the presence of potassium hydroxide and isopropyl alcohol to afford the corresponding alcohols. This protocol tolerates other sensitive functional groups like olefinic double bonds and also achieves high chemoselectivity. All the reactions were monitored by GC and GC-MS. The plausible mechanism is also discussed. The method reported in the present article is simple, cost-effective, and provides excellent conversions. Nickel-diphosphine complexes appear as a potential alternative to expensive transition metal complexes.

#### ARTICLE HISTORY

Received 27 March 2020  
Accepted 11 September 2020

#### KEYWORDS

Nickel(II)-diphosphine complex; catalytic transfer hydrogenation; carbonyl compounds; alcohols

Journal of Herbal Medicine 23 (2020) 100378



Contents lists available at ScienceDirect

Journal of Herbal Medicine

journal homepage: [www.elsevier.com/locate/hermed](http://www.elsevier.com/locate/hermed)



### Combination of Aqueous Extracts of *Phyllanthus niruri*, *Boerhavia diffusa*, and *Picrorhiza kurroa* Zingiber officinale alone Inhibit Intracellular Inflammatory Signaling Cascade

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#### ARTICLE INFO

**Keywords:**  
Liver kidney care<sup>®</sup>(LKC<sup>®</sup>)  
Ginger  
Organic India<sup>™</sup>  
Anti-inflammatory activity  
TNF $\alpha$   
Arachidonic acid  
NF $\kappa$ B

#### ABSTRACT

The study aims to assess the *in vitro* anti-inflammatory property of aqueous extracts of novel herbal formulations consisting of *Phyllanthus niruri*, *Boerhavia diffusa* and *Picrorhiza kurroa* (Liver Kidney Care<sup>®</sup>- LKC<sup>®</sup>-Organic India<sup>™</sup>) and *Zingiber officinale* (Ginger, Organic India<sup>™</sup>). The extracts were analyzed by Liquid Chromatography-Mass Spectrometry (LC-MS) for the detection of active ingredients. LC-MS confirmed the presence of active ingredients Phyllanthin, Boeravinone-B, Picnoidin I and Picnoidin II in LKC<sup>®</sup>, and 6-Gingerol in Ginger. Cytotoxicity assessments were done by Trypan blue cell exclusion method. The cells were pre-incubated with extracts from two herbal formulations LKC<sup>®</sup> or Ginger prior to TNF $\alpha$  or arachidonic acid (AA) stimulation to determine their effects on inflammatory signalling. Non-toxic doses of the extracts were used to determine their anti-inflammatory property by quantifying mRNA expression of *IL-6*, *IKK $\alpha$* , *ALOX5* and *COX2* using qPCR and protein expression of *I $\kappa$ B $\alpha$*  and phospho-p65 by western blot. TNF $\alpha$ -induced mRNA expression of *IL-6*, *IKK $\alpha$*  and *COX2*, and *I $\kappa$ B $\alpha$*  protein degradation along with phosphorylation of p65 was inhibited by LKC<sup>®</sup> and Ginger extracts. AA-induced mRNA expression of *COX2*, *ALOX5* and *IL-6*, and phosphorylation of p65 was inhibited by LKC<sup>®</sup> and Ginger extracts. LKC<sup>®</sup> and Ginger aqueous extracts inhibited TNF $\alpha$  or AA-induced intracellular inflammatory signalling pathways (NF $\kappa$ B, cyclooxygenase, lipooxygenase), suggesting the anti-inflammatory potential of these herbal formulations.

## Hearty Congratulations to Dr. Prakashaiah B G



*Dr Prakashaiah B G applied project to the VGST under the scheme of CISEE: Centers of Innovative Science, Engineering and Education. The title of the project is Effective replace of strontium chromate from the aerospace coating system. The aim of this project is to development of the effective novel organic corrosion inhibitors for AA2024-T3, AA7075-T6 and AA8090-T8.*

 SpringerLink

Published: 28 October 2020

### **Enhancement of Anticorrosion Properties of Epoxy Based Primer Coating by Bis[[3,4-Dihydroxyphenylmethylene] carbonothioicdihydrazide] on AA2024-T3 Alloy**

B. G. Prakashaiah, A. Nityananda Shetty<sup>✉</sup> & B. E. Amitha Rani

*Surface Engineering and Applied Electrochemistry* 56, 610–623(2020) | [Cite this article](#)

27 Accesses | [Metrics](#)

#### Abstract

A corrosion inhibitor bis[[3,4-dihydroxyphenylmethylene]carbonothioicdihydrazide] (DCT) was synthesized and used to improve the corrosion resistance of an epoxy based primer coating on AA2024-T3 alloy in NaCl solution. The ability of DCT to inhibit the corrosion was evaluated by electrochemical studies. The compound exhibited an inhibition efficiency of 99%. The surfaces of the corroded specimens were characterized by field emission scanning electron microscopy, energy dispersive X-ray spectroscopy, and X-ray photoelectron spectroscopy. The anticorrosion nature of the substrate coated with a commercial epoxy-based primer doped with DCT was evaluated by electrochemical impedance spectroscopy and a salt spray test. The results established not only the ability of DCT to improve the anticorrosion property of the epoxy based primer coating on AA2024-T3 alloy but also a sustained corrosion protection (1000 h) of the alloy.



*Prof. Jeslin had secured THREE GOLD Medals and TWO Cash Prizes from Bangalore University for bagging the First Rank in MA English, 2017-19 batch. She had received the awards from Dr.K Shivan, Chairman of ISRO and Dr. Venugopal the Vice Chancellor of BU on the 30th of January, 2021. We are grateful to have Prof. Jeslin at BSE, AIT and we wish her to continue her endeavors in her future goals too. We wish her to transfer her vast knowledge in English subject to be transferred to our Engineering Students to improve their communication skills and personality development.*



**KSHAMA JAIN**

**Asst. Prof.**

Has qualified the Karnataka State Eligibility Test (KSET) for Lectures / Assistant Professorship held on 31<sup>st</sup> December 2017



**Karnataka State Eligibility Test Center (KSET)**

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**Mr./Ms KSHAMA GOYAL**

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*Karnataka State Eligibility Test (KSET) for Lecturer / Assistant Professorship held on 31<sup>st</sup> December 2017*

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