YENEPOYA
(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

Details of the Collaborative Activity

2017-2020

Name of the Collaborating Institute: Dept. of Mechanical Engineering, Dept of Chemistry, National Institute of Technology Karnataka (N.I.T.K), Surathkal, Mangaluru India

Name of the Collaborating Department from YDU: Yenepoya Research Center

Activities:

- Collaborative research projects were carried out by Department of Mechanical Engineering, National Institute of Technology Karnataka (N.I.T.K), Surathkal, and Yenepoya Research Center. The following research scholars have utilised the research facilities and published the following article
    - Mr. Prithivirajan S
    - Mr. KV Sandeep
    - Vibin Wilson
    - Deepika D

Joint Research Publication

- Prithivirajan S, Nyahale MB, Naik GM, Narendranath S, Prabhu A, Rekha PD. Bio-corrosion impacts on mechanical integrity of ZM21 Mg for orthopaedic implant application processed by equal channel angular pressing. *Journal of Materials Science: Materials in Medicine.* 2021; 32(6):1-3.

- Naik P, Keremane SK, Elmorsy RM, EL-Shafei A, Airody AV. Carbozole based organic dyes as affective photosensitiser: A comprehensive analysis of their structure –property relationships. *Electrochemical Science Advances*. 2021: e2100061.

ATTESTED
Dr.Gangadhara Somayaji K.S.
Registrar
Yenepoya(Deemed to be University)
University Road, Deralakatte
Mangalore- 575 018, Karnataka

Fwd: pdf

Prasanna B.D <prsnbhat@gmail.com>
Thu 11/01/2018 12:25 PM
To: Dr. Rekha P D <rekhapd@hotmail.com>

1 attachments (465 KB)
JPAM_Vol_11_No4_p_1987-1998.pdf;

Dear Dr. Rekha,
Greetings. Finally our paper got published in Journal of Pure and Applied Microbiology, which is an SCI journal. Please find the soft copy in the attachment. Thank you for your help in conducting in vitro trails. In fact Anusha has submitted her thesis, 2 weeks back and she has acknowledged your support in her thesis as well.

Sincerely
Prasanna

Prasanna Belur. D PhD
Assistant Professor
Dept. of Chemical Engineering.
NITK Surathkal, Srinivasnagar.
Mangalore-575 025.
India

http://chemical.nitk.ac.in/faculty/prasanna-b-d
http://orcid.org/0000-0003-2908-4511
https://scholar.google.co.in/citations?user=r9BCdpQAAAAJ&hl=en

---------- Forwarded message ----------
From: **Dr. M.N. Khan** <micro_drkhan@yahoo.com>
Date: Thu, Jan 11, 2018 at 12:12 PM
Subject: pdf
To: "Prasanna B.D" <prsnbhat@gmail.com>

find your full article pdf.

Looking forward to hear from you soon.

Regards
Dr. M.N. Khan
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Home / Current Issue / Production Of Fibrinolytic Enzyme By The Marine Isolate Serratia Marcescens Subsp. Sakunensis...

Production Of Fibrinolytic Enzyme By The Marine Isolate Serratia Marcescens Subsp. Sakunensis And Its In-Vitro Anticoagulant And Thrombolytic Potential

Anusha Krishnamurthy[1], Prasanna Devarbhat Belur*[1], Prachi Rai[1], Punchappady Devasya Rekha[2]

SEARCH

[1]Department of Chemical Engineering, National Institute of Technology Karnataka (N.I.T.K), Surathkal, Srinivasnagar, Mangaluru – 575 025, Karnataka, India.

[2]Yenepoya Research Centre, Yenepoya University, University Road, Deralakatte, Mangaluru – 575 018, Karnataka, India.

DOI: http://dx.doi.org/10.22207/JPAM.11.4.41

Original Research

Bio-corrosion impacts on mechanical integrity of ZM21 Mg for orthopaedic implant application processed by equal channel angular pressing

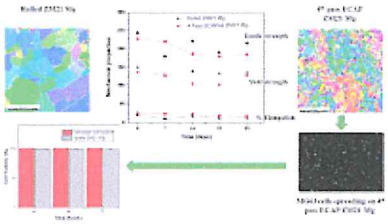
S. Prithivirajan[1] · Mayur Bapu Nyahale[1] · Gajanan M. Naik[2] · S. Narendranath[1] · Ashwini Prabhu[2] · P. D. Rekha[3]

Received: 4 May 2020 / Accepted: 28 May 2021

Abstract

The mechanical integrity of rolled ZM21 Mg was improved by equal channel angular pressing (ECAP) to function as a potential biodegradable bone screw implant. Electron backscattered diffraction (EBSD) revealed deformed grains of 45 µm observed in rolled ZM21 Mg. They were transformed to equiaxed fine grains of 5.4 µm after 4th pass ECAP. The yield strength of rolled and ECAPed ZM21 Mg alloys were comparable. In contrast, 4th pass ZM21 Mg exhibited relatively higher elongation when compared to rolled sample. The mechanical properties of rolled and ECAPed ZM21 Mg were dependant on both grain refinement and crystallographic texture. The rolled and 4th pass ECAPed tensile samples exhibited nonlinear deterioration of mechanical properties when tested after 7, 14, 21 and 28 days immersion in Hank's solution. The evaluation signifies that regardless their processing condition, ZM21 Mg alloys are suitable for surgical areas that requires high mechanical strength. In addition, the 4th pass ECAP samples were viable to MG-63 cells proving themselves to be promising candidates for future in vivo studies.

Graphical Abstract



Supplementary information The online version contains supplementary material available at https://doi.org/10.1007/s10856-021-06535-5.

✉ S. Prithivirajan
sekaprithiviraj@gmail.com

[1] Corrosion Engineering Lab, Department of Mechanical Engineering, National Institute of Technology Karnataka, Surathkal, Srinivasanagar, Mangalore, Karnataka, India

[2] Department of Mechanical Engineering, Mangalore Institute of Technology and Engineering, Moodbidri, Mangalore, Karnataka, India

[3] Yenepoya Research Centre, Yenepoya Medical College, Yenepoya (Deemed to be University), Deralakatte, Mangalore, Karnataka, India

1 Introduction

Biodegradable implants degrade in the human body and the degraded products are being consumed or excreted. Biodegradable implants should exhibit sufficient mechanical strength until healing is completed [1, 2]. Magnesium (Mg) and its alloys have been widely studied as degradable metallic biomaterials due to their degradability and the superior combination of strength and ductility over polymers and permanent implants. Mg alloys are potentially used as bone implants and stents due to their low density, inherent biocompatibility, and adequate mechanical properties [3, 4]. The elastic modulus of Mg alloys (40–45 GPa)

Journal of Materials Science: Materials in Medicine (2021)32:65
https://doi.org/10.1007/s10856-021-06535-5

BIOMATERIALS SYNTHESIS AND CHARACTERIZATION

Original Research

Bio-corrosion impacts on mechanical integrity of ZM21 Mg for orthopaedic implant application processed by equal channel angular pressing

S. Prithivirajan[1] · Mayur Bapu Nyahale[1] · Gajanan M. Naik[2] · S. Narendranath[1] · Ashwini Prabhu[3] · P. D. Rekha[3]

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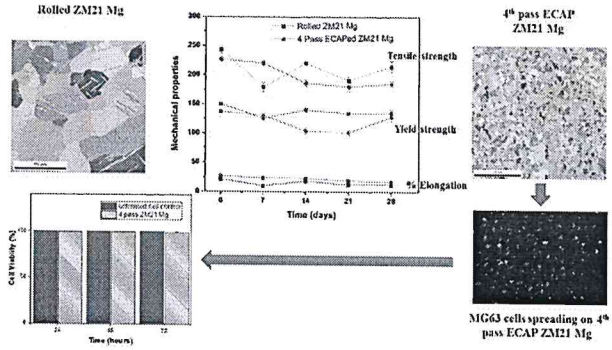
Graphical Abstract



Supplementary information The online version contains supplementary material available at https://doi.org/10.1007/s10856-021-06535-5.

✉ S. Prithivirajan
sekarprithiviraj@gmail.com

[1] Corrosion Engineering Lab, Department of Mechanical Engineering, National Institute of Technology Karnataka, Surathkal, Srinivasanagar, Mangalore, Karnataka, India

[2] Department of Mechanical Engineering, Mangalore Institute of Technology and Engineering, Moodbidri, Mangalore, Karnataka, India

[3] Yenepoya Research Centre, Yenepoya Medical College, Yenepoya (Deemed to be University), Deralakatte, Mangalore, Karnataka, India

Published online: 12 June 2021

1 Introduction

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Date:15/07/2019

From,

K V Sandeep Moudgalya
Roll no-173DP003, Regn no-173021
V semester, M.Tech (Research), Design and Precision Engg stream,
Department of mechanical Engg, NITK, Surathkal.

To,

Deputy Director
Yenepoya Medical Research Centre,
Yenepoya University.

Submitted through proper channel

Dear Sir,

Sub: Requisition for carrying out in-vitro biocompatibility test

I'm a Post graduate research scholar from NITK, Surathkal. I'm working on a biomaterial for orthopedic fracture fixative application. I wanted to carry out in-vitro biocompatibility tests for the material. I humbly request you to provide permission to carry out the tests in your institute, whilst I assure you atmost discipline in due period.

Thanking you.

Yours faithfully

K V Sandeep Moudgalya 15/7/19

Resesarch Guide:
Recommended and forwarded
15/07/2019

Dr. H Suresh Hebbar
Professor,
Department of Mechanical Engg,
NITK, Surathkal

Dr. H. SURESH HEBBAR
Professor
Dept. of Mechanical Engineering
National Institute of Technology Karnataka
Surathkal, Srinivasnagar - 575 025, India

Head of the Department:

Dr. Shrikantha. S. Rao
Professor and Head,
Department of Mechanical Engg,
NITK, Surathkal

DR. SHRIKANTHA S. RAO
Professor & Head
Dept. of Mechanical Engineering
National Institute of Technology Karnataka Surathkal
Srinivasnagar-575 025, (INDIA)

धातुकी एंव पदार्थ अभियांत्रिकी विभाग
राष्ट्रीय प्रौद्योगिकी संस्थान कर्नाटक, सुरत्कल
DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

Dr. Udaya Bhat K.
Professor

03 – 06 – 2019

To,

Dr. Rekha P.D.
Professor and Deputy Director,
Yenapoya Research Center.

Sub: Request for permission to conduct bactericidal tests

Dear Madam,

Greetings from NITK Surathkal.

Mr. Vibin Wilson (Roll No.172ML024), a 2nd year M.Tech. (Materials Engineering) student of our Department is working under me for his PG project work. As a part of his work he should conduct bactericidal tests. Hence, I hereby request you to grant the permission to access these facilities at your institute.

Thanking you,

Udaya Bhat K

(Udaya Bhat K.) 03/06/19

Department of Metallurgical &
Materials Engineering
National Institute of Technology Karnataka, Surathkal
Post Srinivasnagar, Mangaluru - 575 025
Karnataka, India

Address : P.O. Srinivasnagar, Mangalore - 575 025, Karnataka, India
Phone/Fax : Head (O) Direct : 0824-2474059
EPBX : 0824-2474000 Extn. 3050
E-mail : hodmme@nitk.edu.in

EPBX : 2474000-2474023
Fax : 0824-2474033
Grams : NITKS
Website : www.nitk.ac.in

RESEARCH ARTICLE
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Chemistry Europe
European Chemical Societies Publishing

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Accepted: 14 May 2021

Carbazole based organic dyes as effective photosensitizers: A comprehensive analysis of their structure-property relationships

Praveen Naik[1] | **Kavya S. Keremane**[1] | **Mohamed R. Elmorsy**[2,3] | **Ahmed El-Shafei**[2] | **Airody Vasudeva Adhikari**[1,4]

[1] Department of Chemistry, National Institute of Technology Karnataka, Mangalore, India

[2] Polymer and Color Chemistry Program, North Carolina State University, Raleigh, North Carolina, USA

[3] Department of Chemistry, Faculty of Science, Mansoura University, Mansoura, Egypt

[4] Yenepoya Research Centre, Yenepoya (deemed to be) University, Deralakatte, India

Correspondence
Airody Vasudeva Adhikari,
Email: avachem@gmail.com
Ahmed El-Shafei,
Email: ahmed_el-shafei@ncsu.edu

Abstract

The present work describes the effect of structural modification of carbazole-based photosensitizers carrying carboxylic acid as a common anchoring functionality, on the photovoltaic parameters of newly fabricated DSSCs. In this study, we have selected our previously reported three carbazole-based derivatives, *viz.* $\mathbf{S_{1\text{-}3}}$ having different structural designs, that is, D-π-A ($\mathbf{S_1}$), D-D-π-A ($\mathbf{S_2}$), and A-π-D-π-A ($\mathbf{S_3}$) with different donor units and π-spacers, but an identical cyanoacetic acid anchoring unit. We have evaluated their optical, electrochemical, and photovoltaic behaviors in order to explore their structure-property relationships. Also, the theoretical investigations were performed to obtain a deeper understanding of their HOMO-LUMO levels, charge distribution in FMOs, directional flow of electrons within the push-pull type sensitizers, and optical behavior. Finally, the DSSCs were constructed by employing these dyes as sensitizers without any co-absorbents and the performance of the devices was evaluated by using illuminated current-voltage characteristics. Among the tested dyes, di-anchoring $\mathbf{S_3}$ exhibited improved *PCE* of 3.77 % due to its strong adsorption on the TiO_2 surface that resulted in superior V_{OC} of the cell. While the $\mathbf{S_2}$ containing electron-releasing anisole as an auxiliary donor exhibited better J_{SC} value leading to the optimum *PCE* of 3.73 % which is comparable to that of $\mathbf{S_3}$. Obviously, these results validate the role of the π-spacer and additional donor of the sensitizers on the overall performance of the DSSCs.

KEYWORDS
carbazoles, DFT, donor-acceptor dyes, DSSC, photosensitizers

1 | INTRODUCTION

The production of electrical energy from the cleanest and eco-friendly renewable resources is considered to be one of the most challenging scientific problems in the present world. Among the different technologies used for energy generation, the dye-sensitized solar cell (DSSC) that belongs to the family of third-generation photovoltaics,

NITK Attestation

रसायन अभियान्त्रिक विभाग
DEPARTMENT OF CHEMICAL ENGINEERING
राष्ट्रीय प्रौद्योगिकी संस्थान कर्नाटक, सुरत्कल
NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL
पोस्ट श्रीनिवासनगर, मंगलूर - 575 025
POST SRINIVASNAGAR, MANGALORE - 575 025

Ref. No. NITK/CHE/2018-2019/1618

Date : 28.02.2019

To

The Deputy Director
Yenepoya Research Center,
Mangalore

Respected Madam,

Subject: Request for cytotoxicity analysis of samples

Our student, Deepika D, pursuing 8th semester Ph.D (Full-Time) in the department of chemical engineering, under the guidance of Dr. P. E. Jagadeeshbabu require cytotoxicity analysis for her samples. It is very essential for her research work. We request you kindly to analyze the samples.

Thanking you,

Yours truly,

Dr. P.E. Jagadeesh Babu
Research Guide

Dr. Hari Mahalingam
(Head of the Department)

टेलिफाक्स (Fax) : +91-824-2474033
E-mail : hodchemical@nitk.ac.in
Web.site : www.nitk.ac.in

दूरभाष (Ph) : +91-824-2474000, विस्तार (Extn.) : 3042
+91-824-2474057 सीधा (Direct)

Professor

Department of Mechanical Engineering
राष्ट्रीय प्रौद्योगिकी संस्थान कर्नाटक, सुरत्कल
National Institute of Technology Karnataka, Surathkal
Srinivasnagar, Mangalore, India - 575 025

Off. : +91-824-2474000
Extn. 3660
Fax : +91-824-2474033
Cell : +919448793833
snnath88@yahoo.co.in
bayalu@nitk.ac.in
Website : www.nitk.ac.in

Date: 23.08.2019

From:
Prithivirajan Sekar,
Research Scholar (177ME013),
Department of Mechanical Engineering,
NITK-Surathkal.
Mangalore 575025.

To,
The Head,
Yenepoya Research Centre,
University Road, Deralakatte,
Mangalore 575018.

SUB: Requisition for collaboration with Yenepoya Research Centre – regd.

Dear Sir,

Our research group is working in the area of "Studies on mechanical properties and corrosion behavior of Magnesium alloys subject to Equal Channel Angular Pressing". We have improved the mechanical properties and corrosion behavior of AZ series Mg alloys. Further, we are interested in exploring the biodegradable properties of ZM21 Magnesium alloy for application in medical implants. Therefore, we are requesting you to collaborate and help us in carrying out biodegradable studies at your end.

Thanking You.

Yours truly,

Prof.Narendranath S

Dr. NARENDRANATH S.,
PROFESSOR
Dept. of Mechanical Engineering
National Institute of Technology Karnataka
SURATHKAL, SRINIVASNAGAR P. O.
MANGALORE - 575 025. INDIA

Prithivirajan S
(Research Scholar)