



Anand Nagar, Krishnankoil - 626126, Srivilliputtur (via), Virudhunagar District, Tamilnadu.

APPLICATION FOR ADMISSION TO Ph.D. PROGRAMMES

Date of Application:17-06-2020

Department	PHYSICS	Application No.	20200094
Area of Research	MATERIAL SCIENCE	Research Mode	PART TIME

Name :SANTHOSHBALAJI M
Date of Birth / Age :11-06-1996 / 24 Years
Gender :MALE
Category :BC
e-Mail ID :santhoshb728@gmail.com
Mobile :9790280084



Father's/Husband's Name	R.MUTHUVIJAYAN	Father's/Husband's Occupation	OLD IRON MERCHANT
Family Income	1,00,000	Residential Type	RURAL
Birth Place	KAMUTHI	Mother Tongue	TAMIL
Religion	HINDU	Martial Status	SINGLE
Aadhaar No.	949392586940	PAN No.	LFZPS9055Q
Physically Challenged	NO	Type of Disability	-
Address for Communication: 27, NADAR BAZZAR KAMUTHI RAMNAD DISTRICT TAMILNADU INDIA Pin-623603		Permenant Address: 27, NADARBAZZAR KAMUTHI RAMNAD DISTRICT TAMILNADU INDIA Pin-623603	

Qualification						
Degree	Discipline	College/university	Year Passed	AVG/CGPA	Class	Mode
SECONDARY	STATEBOARD	K N HSS	2012	82.8%	FIRST	REGULAR
HIGHER SECONDARY	MATRICULATION	RAHMANIA M HSS	2014	66%	FIRST	REGULAR
BSC	PHYSICS	NMSSVN COLLEGE	2017	62%	FIRST	REGULAR
MSC	PHYSICS	NMSSVN COLLEGE	2019	64.9%	FIRST	REGULAR

Experience				
Organization	Designation	Experience From	Experience TO	Work Nature
AAIVALAYAM-(DIRAC)	JUNIOR RESEARCHER-ADI	2019-08-01	2020-06-17	JUNIOR RESEARCHER IN CENTER FOR ADVANCEDMATERIALS

Payment Details				
Transaction ID	Reference	Date of transaction	Amount	Status
20200094_200630132024	SUR28947079302	30-06-2020	600	SUCCESS

Cadmium sulphide based semiconducting Nanocomposites for visible light photo catalytic application

Objective:

- ❖ To synthesize CdS based semiconducting nanocomposites
- ❖ To analyse their photo catalytic properties
- ❖ To improve the performance of photocatalyst by doping

Signification of work:

Cadmium sulphide is an important group of II-VI semiconducting nanomaterial with excellent physical properties and wide band gap energy, are successful in the utilization of photo catalytic application. Photocatalytic technology is one of important technology to solve environmental and energy issues. In recent years, the visible light induced photo degradation of dyes using nanoparticles is drawing more research interest to make the process more effective, green, and economical. Most of these researches are focused on enhancing the photo catalytic efficiency, by using different doped nanoparticles. In general, for the degradation of the organic dyes, the utilization of electron-hole pairs are playing an important role, on the other hand, the photo catalytic activity is suppressed due to the Recombination of electron-hole pair. The best path to enhance the photo catalytic activity is by doping the CdS semiconductor with the transition metals, having magnetic property, such as Fe, Co and Ni. Because, when doping the magnetic transition metal ion like nickel to the host lattice, new defect locations are generated that act as an electron bond and restrains the photo generated hole-electrons pair recombination. In consequence, created electrons and holes are shifted towards catalyst surface where they contribute to degrading process with the organic pigment.

Cadmium sulphide, a visible-light-responsive photo catalyst with a band gap of 2.4 eV, is one of the most prominent semiconductor photo catalysts among the various sulphides for photo catalytic H₂ production. Various sulphides for photo catalytic H₂ production. CdS has been the subject of much research in the field of photo catalytic H₂ production. On the one hand, CdS has good performance for visible light absorption at wavelengths Shorter than 516 nm. On the other hand, it has a good carrier transportation capacity, which can make photo generated electrons and holes mobile in a timely and efficient manner, Extending the life of the photo generated carriers and leading to high photo catalytic activity. CdS photo catalysts have been of great significance for environmental and energy applications over the past few years. CdS-based compositions need to be further developed. On the other hand, a simple and facile

synthetic method with low cost and high safety may provide a new direction to expand the areas of application of photo catalysts. There are some other factors that influence the performance of CdS and CdS-based photo catalysts during the photo catalytic process, such as the morphology, shape, crystal size and so on. Therefore, for further studies a better understanding of the reactive mechanism and theories are necessary and should be given more attention, since this has vital significance for designing and controlling CdS photo catalysts with excellent photo catalytic properties.

Methodology:

Chemical precipitation method will be adopted for the synthesis of CdS based semiconducting nanocomposites.

Scope:

In the future, more attention should be directed toward investigating the relationships between structures, functions, and the mechanism of photo catalytic reactions based on the CdS and CdSe-based photo catalysts. Furthermore, it is expected that CdS and CdSe-based photocatalysts will be the promotion of the solar-fuel applications and environmental protection.

References

1. H. Yan, J. Yang, G. Ma, G. Wu, X. Zong, Z. Lei, J. Shi and C. Li, *J. Catal.*, 2009.
2. M. E. Khan, M. M. Khan and M. H. Cho, *J. Colloid Interface Sci.*, 2016.
3. Y. X. Pan, T. Zhou, J. Han, J. Hong, Y. Wang, W. Zhang and R. Xu, *Catal. Sci. Technol.*, 2016.
4. Sreelekha, N. Subramanyam, K. Amaranatha Reddy, Structural, optical, magnetic and photocatalytic properties of Co doped CuS diluted magnetic Semiconductor nanoparticles E, *Appl. Surf. Sci.* 38 (2016).
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6. G. Thirumala Rao, B. Babu, R. Joyce Stella, Synthesis and characterization of VO²⁺ doped ZnO–CdS composite nanopowder, *J. Mol. Struct.* 1081 (2015).
7. K. Kumar, M. Chitkara, S.I. Singh, Photocatalytic, optical and magnetic

Properties of Fe- doped ZnO nanoparticles prepared by chemical route, *J. Alloys Comp.* 588 (2014).

8. A.P. Alivisatos, Perspectives on the physical chemistry of semiconductor nanocrystals, *J. Phys. Chem*(1996).
9. L.E. Brus, Electron–electron and electron–hole interactions in small semiconductor crystallites: the size dependence of the lowest excited electronic State, *J. Chem*(1984).
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11. P.Y. Yu, M. Cardona, *Fundamental of Semiconductor: Physics and Material Properties*, second ed., Springer, Berlin, Heidelberg, 1999.

CRA 40192051



அறிவியற் புலம்
FACULTY OF SCIENCE

மதுரை காமராசர் பல்கலைக்கழக ஆட்சிப்பேரவை

சந்தேஷ்பாலாஜி. மு. இப்பல்கலைக்கழகத்தில் இணைந்த

தன்னாட்சிக் கல்லூரியான நூ. ம. ச. சி. வி. நூ. கல்லூரி, மதுரை

விதித்திருக்க பாடப் பயிற்சியினையும் தேர்வினையும் நன்கு முடித்த பின்னர் ஏப்ரல் 2017 இல் நடைபெற்ற தேர்வில்
முதல் வகுப்பு பெற்று தேர்வுற்றார் எனக் கல்லூரித் தேர்வு ஏற்புக்குழு பரிந்துரைத்தவாறு.

இயற்சியில் சி. சி. சி. ஆர்வியல் இணையர் பட்டம்

பெறுதற்கு உரியவர் ஆகின்றார் என இதன்வழி அறிவிக்கின்றது.

பல்கலைக்கழக இலச்சினையுடன் இது வழங்கப்படுகின்றது.

The Senate of the MADURAI KAMARAJ UNIVERSITY
hereby makes known that SANTHOSHEALAJI M has been admitted to the

DEGREE OF BACHELOR OF SCIENCE IN PHYSICS

he/she having successfully completed the course of studies and examination prescribed therefor by the
N.M.S.S.V.N. COLLEGE, MADURAI

(an Autonomous College of this University) and upon the recommendation by the College Awards Committee and
having been placed by them in the FIRST CLASS

at the Examination held in APRIL 2017

Register No. : 14213045

Centre Code : 620

Given under the seal of the University



பல்கலைக்கழகம், மதுரை - 625 021
Palkalainagar, Madurai - 625 021
நாள் Dated 29 January 2018

தேர்வாணையர்
Controller of Examinations

பதிவாளர்
Registrar

துணைவேந்தர்
Vice-Chancellor



NADAR MAHAJANA SANGAM S. VELLAICHAMY NADAR COLLEGE

An Autonomous Co-Educational Institution Affiliated to Madurai Kamaraj University

Re-accredited with "A" Grade by NAAC

Nagamalai, Madurai - 625 019, Tamil Nadu, India

MASTER OF SCIENCE IN PHYSICS STATEMENT OF MARKS AND GRADES (CHOICE BASED CREDIT SYSTEM)

S.No.: G 000298



NAME OF THE CANDIDATE SANTHOSHBALAJI M	REGISTER No. 172104026	DATE OF PUBLICATION 10/12/2019
	CENTRE CODE 620	EXAM MONTH & YEAR NOV. 2019

SEMESTER	COURSE CODE	COURSE TITLE	CREDIT	MAXIMUM			MARKS SECURED			GRADE POINT	GRADE	RESULT	MONTH & YEAR
				INTERNAL	EXTERNAL	TOTAL	INTERNAL	EXTERNAL	TOTAL				
1	172104101	MATHEMATICAL PHYSICS - I	5	25	75	100	17	50	67	6.7	A+	P	N17
1	172104102	CLASSICAL AND STATISTICAL MECHANICS	5	25	75	100	14	44	58	5.8	B+	P	N19
1	172104103	ELECTROMAGNETIC THEORY	5	25	75	100	15	40	55	5.5	B+	P	N17
1	172104104	ELECTIVE - NUMERICAL METHODS	5	25	75	100	22	42	64	6.4	A	P	N17
2	172104201	MATHEMATICAL PHYSICS - II	5	25	75	100	17	37	54	5.4	B	P	N18
2	172104202	QUANTUM MECHANICS - I	5	25	75	100	11	50	61	6.1	A	P	A19
2	172104203	APPLIED ELECTRONICS	5	25	75	100	16	53	69	6.9	A+	P	A18
2	172104204	NON-ELECTRONICS PRACTICAL	2	40	60	100	32	49	81	8.1	D+	P	A18
2	172104205	ELECTRONICS PRACTICAL	2	40	60	100	32	60	92	9.2	O	P	A18
2	174604222	NME - APPLIED CHEMISTRY	4	25	75	100	20	35	55	5.5	B+	P	A18
3	172104301	SOLID STATE PHYSICS - I	5	25	75	100	16	44	60	6.0	A	P	N18
3	172104302	QUANTUM MECHANICS - II	5	25	75	100	19	41	60	6.0	A	P	N18
3	172104303	NUCLEAR PHYSICS	5	25	75	100	20	42	62	6.2	A	P	N18
3	172104304	ELECTIVE : MICROPROCESSOR	5	25	75	100	17	43	60	6.0	A	P	N18
4	172104401	SOLID STATE PHYSICS - II	5	25	75	100	22	34	56	5.6	B+	P	A19
4	172104402	APPLIED OPTICS AND NON LINEAR DYNAMICS	5	25	75	100	20	42	62	6.2	A	P	A19
4	172104403	MOLECULAR SPECTROSCOPY	5	25	75	100	23	46	69	6.9	A+	P	A19
4	172104404	PRACTICALS - III	3	40	60	100	34	56	90	9.0	O	P	A19
4	172104405	ELECTIVE - NANO SCIENCE	5	25	75	100	20	49	69	6.9	A+	P	A19
4	172104406	ELECTIVE - PROJECT	4	40	60	100	39	56	95	9.5	O+	P	A19

*** END OF STATEMENT ***



PERFORMANCE IN THE CURRENT SEMESTER Credit Earned : 27 GPA - 7.15 Addl. Credit Earned : --- Medium of Instruction : English	CUMULATIVE PERFORMANCE Credit Earned : 90 CGPA - 6.49 A FIRST CLASS Addl. Credit Earned : --- Total Credit Earned : 90
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 Signature of the Student	 (Dr. A. JAWAHAR) PRINCIPAL (I/c)	 (Dr. R. RAJESWARA PALANICHAMY) CONTROLLER OF EXAMINATIONS
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NADAR MAHAJANA SANGAM
S.VELLAICHAMY NADAR COLLEGE

An Autonomous Institution Affiliated to Madurai Kamaraj University
Re-accredited with 'A' Grade by NAAC
NAGAMALAI, MADURAI - 625 019.



TRANSFER - CUM - CONDUCT CERTIFICATE

Serial No. : **8281** Admission No. : **29238** Roll No. **172104026**

1. (a) Name of the College : NADAR MAHAJANA SANGAM
S. VELLAICHAMY NADAR COLLEGE
Nagamalai, Madurai - 625 019.
- (b) Name of the District : MADURAI DISTRICT.
2. Name of the Student (in Block Letters)
(as entered in +2 or equivalent Certificate) : **SANTHOSHBALAJI M**
3. Name of the Father or Mother : **MUTHU VIJAYAN R**
4. Nationality and Religion : **Indian - HINDU**
5. Caste and Community - B.C./M.B.C./D.N.C./S.C./S.T. : **NADAR - BC**
6. Sex : **MALE**
7. Date of Birth : **11/06/1996 (Eleventh
June-Nineteen Ninety Six)**
8. Personal Marks of Identification : (a) **A MOLE ON THE RIGHT CHEEK**
(b) **A MOLE ON THE CENTRE OF THE CHEST**
9. Date of admission and class in which admitted
(the year to be entered in words) : **18/07/2017, I-M.Sc., Physics**
10. Course of Study : **M.Sc., Physics**
11. Class in which the Student was studying at the
time of leaving : **II-M.Sc., Physics**
12. Whether the Student has paid all the fees due to the College : **Yes**
13. Whether the Student was in receipt of any scholarship : **Yes**
14. Whether the Student has undergone medical inspection, if any,
during the first academic year : **Yes**
15. Whether qualified for promotion to a higher class. : **Refer to Mark Statement**
16. Date on which the Student actually left the College : **April-2019**
17. The Student's Conduct and Character : **good**
18. Date of the Transfer Certificate : **22/05/2019**
19. Reason for leaving the College : **Completed the Course**

Name of the College	Academic Year(s)	Class Studied	Part - I	Medium of Instruction
NADAR MAHAJANA SANGAM S. VELLAICHAMY NADAR COLLEGE Nagamalai, Madurai - 625 019.	2017-2019	M.Sc., Physics	---	English

- Erasures and unauthenticated or fraudulent alterations in the certificate will lead to its cancellation.
- Should be signed in ink by the Head of the Institution who will be held responsible for the correctness of the entries.

Declaration by the Parent or Guardian.

I hereby declare that the particulars recorded against items 2 to 8 are correct and that no change will be demanded by me in future.

Signature of the Student



Signature of the Parent / Guardian

PRINCIPAL
NADAR MAHAJANA SANGAM
S. VELLAICHAMY NADAR COLLEGE
Nagamalai, Madurai - 625 019

आयकर विभाग
INCOME TAX DEPARTMENT



भारत सरकार
GOVT. OF INDIA



स्थायी लेखा संख्या कार्ड
Permanent Account Number Card

LFZPS9055Q

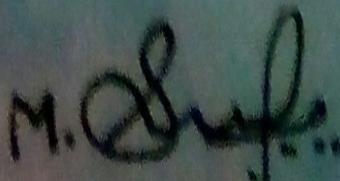


नाम / Name
SANTHOSH BALAJI

पिता का नाम / Father's Name
MUTHUVIJAYAN

16022019

जन्म की तारीख /
Date of Birth
11/06/1996


हस्ताक्षर / Signature

India Driving Licence (Tamilnadu)

Form 7

DOI 17/07/2015



सर्वमेव जयते

D.L.No : TN65Z20150003412

Name : SANTHOSH BALAJI M

S/D/W of : MUTHU VIJAYAN

Address :

34/ 1 PERUMAL NADAR ST

KAMUTHI TK

RAMNAD DT

Temp. Add:

MUTHU DRIVING SCHOOL

D.O.B. 11/06/1996



Punishments:

R.Dis. 767 / 2011

GCP-374-7-13,35,000 Cps.-09-02-2010 [Hcl-4]

Dated.....20

BC



சான்றிதழ் எண் :
Certificate No. :

மாவட்டக் குறியீடு எண் : 16
District Code :

வட்டக் குறியீடு எண் : 06
Taluk Code :

கிராமக் குறியீடு எண் : 008
Village Code :

10298735

வகுப்புச் சான்றிதழ்
COMMUNITY CERTIFICATE

இராமநாதபுரம் மாவட்டம்.....கமுகி.....வட்டம்

கமுகி திரு/ திருமதி/ செல்வன்/ செல்வி

சந்திராபாஸாஜி, தகப்பனார்/கணவர், பெயர்

முத்துலட்சுமி, இறந்த-நாடார் வகுப்பைச் சார்ந்தவர்

நாடு அரசு ஆணை நிலை எண் 28, பிற்பட்ட மற்றும் மிகவும் பிற்பட்ட பிரிவின்

நலத் துறை நாள் 19-7-1994 வரிசை எண் 0.82 படி பிற்பட்ட பிரிவினைச்

சார்ந்தவர் எனச் சான்றளிக்கப்படுகிறது.

This is to certify that..... Son / Daughter of

Thiru..... of

Village / Town..... Taluk.....

District of the State of Tamil Nadu belongs to..... Community, which is recognised as a

Backward Class as per Government Order (Ms.) No. 28, Backward Classes

and Most Backward Classes Welfare, dated 19th July 1994

vide Serial No.....

அர 2. தமி திரு / திருமதி / செல்வன் / செல்வி

என்பவரும் அவருடைய குடும்பத்தினரும் தமிழ்நாட்டில் இராமநாதபுரம்

மாவட்டத்தில் கமுகி வட்டத்தில் கமுகி

கிராமத்தில் / நகரத்தில் வசித்து வருகிறார்கள் எனச் சான்றளிக்கப்படுகிறது

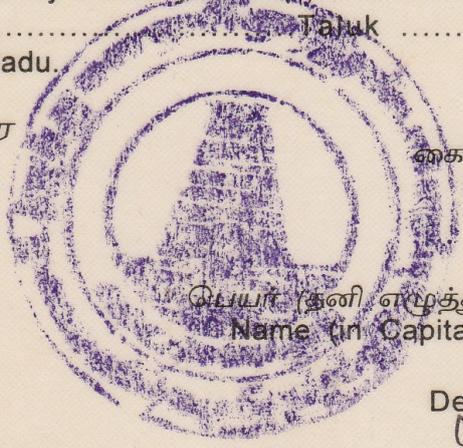
It is certified that Thiru/Tmt./Selvan/Selvi..... and

his/her family ordinarily reside(s) at Village/Town

..... Taluk District of

Tamil Nadu.

முத்திரை
Seal.



கையொப்பம்
Signature

11/8/2011

ZONAL DEPUTY TAHSILDAR
KAMUTHI

நாள்
Date

பெயர் (குனி எழுத்துக்களில்)
Name (in Capital Letters)

பதவி
Designation

ANNEXURE-I

CERTIFICATE FROM THE ORGANISATION WHERE THE CANDIDATE IS EMPLOYED

Certified that Mr. _____ M. Santhosh Balaji _____ is employed as _____
_____ Junior ADI Researcher _____ (Designation) in the _____ Centre
for Advanced Materials _____ (Department/Division Name) of _____ Aaivalayam-Dynamic /Integrated
Research Academy and Corporations (A-DIRAC) _____
(Institution/Industry Name).

We have no objection in forwarding his/her application for the Ph.D. Research Programme.

FOR PART TIME:

The candidate will be permitted to undertake part time study in the University/College and will be allowed to be present for discussions with the supervisor, attending course works, conduct of experiments and participations in seminars and related presentations. Further the required facilities at our organization will also be provided to the candidate for doing research.



Date: 29.06.2020

Signature of the Head of Organization with office



Dr. D. Sathish Chander Ph.D
President
Aaivalayam - DIRAC (Reg.No: 126/BK-IV/2018)
3-1, Taunsa Nagar, A-Block
Bommanampalayam
Coimbatore - 641 046 (TN), INDIA.