

From :
Dr. Goutam Biswas, Department of Physics,
Ramananda College, P.O.- Bishnupur, Dist.-Bankura.
PIN - 722122.
[Phone : 03244-252059]

To
The Deputy Secretary,
University Grants Commission,
Eastern Regional Office,
LB-8, Sector III, Salt Lake, Kolkata -700 098.

Subject : Final Report of Minor project (Ref.F.PSW.
-087/03-04(ERO) dt. 23.3.04 and 15.7.05)

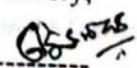
Dear Madam,

Enclosed please find a copy of final Minor Project report on "Microstructure Characterization of Nanocrystalline Materials by X-ray Powder Diffraction". I am hereby submitting a copy of audited report (2005 -2006) of the above project.

In this regard, I like to mention that previous year audited report (2004-2005) was already given with the first year Annual report.

Thanking you,

Yours sincerely,



Goutam Biswas
(Principal -investigator)

Enclosures: -

- (1) A copy the Minor project (Pages : 21)
- (2) Acceptance letter of paper on PbTiO₃ at 34th National seminar on Crystallography which was held on 10 -12 January, 2005 at Gauhati University. Guwahati.
- (3) A certificate from Dr. S. K. Pradhan, (Deptt. of Physics, Burdwan University) Co-investigator of this Minor project.
- (4) Audited report (2005 -2006) of this Minor project.

RECEIVED

JAN 25 19 06
University Grants Commission
Eastern Regional Office
Kolkata 700 098



UNIVERSITY GRANTS COMMISSION
EASTERN REGIONAL OFFICE
LB 8 Sector III Salt Lake, Kolkata 700 098

No. PSW-087/03-04 (ERO)

Date: 15-Jul-05

The Accounts Officer
University Grants Commission
Eastern Regional Office, Kolkata 700 098

S.No. 60179

Sub : Release of Grant-in-Aid during the Current financial year, under Plan, to
Ramananda College

Sir/Madam,

I am directed to convey the sanction of the Commission for payment of Rs. 12000
Towards the scheme Minor Research Project in Science
To the Principal, Ramananda College
for the Plan expenditure to be incurred during the current financial year as per details given below:

Purpose of the grant	Approved allocation	Amount already sanctioned	Amount being sanctioned now	Total grant including the grant now being sanctioned
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Goutam Biswas, Physics 2nd instalment	70000	55000	12000	67000
MRP				

The College is requested to note:

Total

12000

- A. Audited Utilisation Certificates and statements of Expenditure of all grant sanctioned during a financial year under various schemes of the UGC are to be submitted separately for each schemes latest by 31st December after the financial year ending.
- B. No photocopy of bills/vouchers or the originals and detailed list of purchases should be sent with the accounts submitted unless specifically called for.

- The sanctioned amount is debitable to the major head 5.1.3 and valid for payment during the current financial year only.
- The amount of the grant shall be drawn by the Accounts Officer (Drawing and Disbursing Officer), University Grants Commission on the Grant-in-Aid bill and shall be disbursed to and credited to grantee as above through Demand Draft.
- The grant is subject to the adjustment on the basis of Utilisation Certificate in the prescribed proforma submitted by the University/College/Institution.
- The University/College shall maintain proper accounts of the expenditure out of the grant which shall be utilised only on approved items of expenditure
- The Utilisation Certificate to the effect that the grant has been utilised for the purpose for which it has been sanctioned shall be furnished to the University Grants Commission as early as possible after the closing of the current financial year.
- The assets acquired wholly or substantially out of the University Grants Commission's grant shall not be disposed or encumbered or utilised for the purpose other than those for which the grant was given, without proper sanction of the University Grants Commission.
- A register of assets acquired, wholly or substantially out of the grant shall be maintained by the University/College in the prescribed form.
- The grantee institution shall ensure the utilization of grants-in-aid for which it is being sanctioned/paid. In case of non-utilization/part utilization, the simple interest @6% per annum as amended from time to time on unutilized amount from the date of drawal to the date of refund as per provisions contained in General Financial Rules of Govt. of India will be charged.
- The University/College shall follow strictly all the instructions issued by the Government of India from time to time with regard to reservation of posts to Scheduled Castes and Scheduled Tribes.
- The University/College shall fully implement the Official Language Policy of the Union Govt. and comply with the Official Language Act, 1963 and Official Languages (used for official purposes of the Union) Rules, 1976 etc.
- The sanction issues in exercise of the delegation of powers vide Commission Office Order No. 25/92 dated May 01, 1992.
- An amount of Rs. _____ out of the grant of Rs. _____ sanctioned vide letter No. F. _____ (ERO) dated..... has been utilized by the College for the purpose for which it was sanctioned and noted in the Grant-in-Aid Register.
- The funds to the extent are available under the Scheme.

Copy forwarded for information and necessary action to :

1. Principal

Ramananda College

Bishnupur, Bankura

W. Bengal 722 122.

He/She is requested to abide by these instructions/Guidelines of sanction order.

- Registrar Burdwan University
- Auditor General, Govt. of W. Bengal
- The Secretary, Higher Education, Govt. of W. Bengal
- The Director of Public Instructions (Higher Education) Govt. of W. Bengal
- Goutam Biswas, Physics

Yours faithfully,

(Dr. Ratnabali Banerjee)
Deputy Secretary

(Dr. Ratnabali Banerjee)
Deputy Secretary

Annexure – IX
UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI – 110 002.

PROFORMA FOR SUBMISSION OF INFORMATION AT THE TIME OF SENDING
THE FINAL REPORT OF THE WORK DONE ON THE PROJECT

1. NAME AND ADDRESS OF THE PRINCIPAL INVESTIGATOR - Dr. Goutam Biswas
2. NAME AND ADDRESS OF THE INSTITUTION – Ramananda College, Bishnupur (Bankura)
3. UGC APPROVAL NO. AND DATE : F.PSW -087/03-04(ERO) dt. 23.3.04
4. DATE OF IMPLEMENTATION : 15.05.04
5. TENURE OF THE PROJECT : Two (2) Years.
6. TOTAL GRANT ALLOCATED : Rs. 70,000/-
7. TOTAL GRANT RECEIVED : Rs. 67,000/-
8. FINAL EXPENDITURE : Rs. 70,000/-
9. TITLE OF THE PROJECT : "Microstructure Characterization of Nanocrystalline Materials by X-ray Powder diffraction"
10. OBJECTIVES OF THE PROJECT : Structure property co-relations for improving properties of nanocrystalline materials
12. WHETHER OBJECTIVES WERE ACHIEVED : Different kinds of nanocrystalline materials are prepared by high energy ball milling the stiochiometric powder mixture at room temperature. Microstructure characterization of ball milled samples in terms of several lattice imperfection parameters has been made using X-ray powder diffraction data. These are the primary objective of this minor project. However, the final objective to establish structure property co-relations in case of nanocrystalline materials is not achieved due to short duration of the project.
13. ACHIEVEMENTS FROM THE PROJECT : (1) Nanocrystalline perovskite type titanats were prepared by ball milling the stiochiometric mixture of metals oxides at room temperature. (2) Nanocrystalline composites (PbO, TiO₂), TiC, SiC were prepared by ball -milling. It has been observed that nanocrystalline cubic PbTiO₃ phase can be prepared by ball milling by equimolar mixture of PbO and TiO₂ powder at room temperature within 6 hours of duration. However this phase is stable up to 800 degree centigrade. But annealing at 1000 degree centigrade results in phase transition in cubic PbTiO₃ at polymorphic tetragonal PbTiO₃ phase (3) Microstructure characterization in terms of

change in lattice parameters, particle size, lattice strain etc. has been made for all the prepared nanocrystalline samples. As these parameters are directly related to physical properties of any crystalline materials, a proper control over these parameters may help one to proper control on physical properties of the material.

From the preparation and microstructure characterization of ball milled nanocrystalline SiC and TiC powder, following conclusion can be drawn:-

- (1) TiC alloy has been formed within 15 minutes of ball milling and phase transformed from TiC alloy to TiC carbide which is occurred at 35 min of ball milling is a exothermic process.
- (2) Nancrystalline cubic SiC phase obtained by ball milling (details in annexure –I) within 15 hours. The particle size of both the Si and Sic phases (as in the case of TiC) phases decreases with increasing milling time. SiC phase formed within 5 hours of ball milling is very stable one and its lattice parameter remains almost unchanged up to 15 hours of milling.

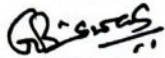
14. SUMMARY OF THE FINDINGS (IN 500 WORDS) : SEE ANNEXURE -I

15. CONTRIBUTION TO THE SOCIETY: Perovskite –type titanats have several important applications to our society. These materials are used as gas sensors and the sensing activity can be improved if the particle size of these materials goes down to nanometer order due to increase in surface to volume ratio. Due to their piezoelectric, dielectric and ferroelectric properties they are also use in different optical and memory devices.

All these materials are prepared from analytical grade samples available abundantly in the market in a very cheap rate. Method of preparation is very simple and does not require any high temperature furnace or any vacuum device and large amount of sample can be prepared within a very short duration. Therefore production cost of these samples is very low and as a result, using these materials quality of the device can be improved by several fields in a considerable reduction in production cost.

16. WHETHER ANY PH.D. ENROLLED/PRODUCED OUT OF THE PROJECT : Not Applicable

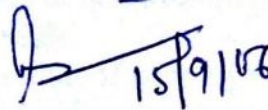
17. NO. OF PUBLICATIONS OUT OF THE PROJECT : (1) One abstract accepted on Preparation and Microstructure Characterization of Nanocrystalline PbTiO_3



(PRINCIPAL INVESTIGATOR)
(Dr. Goutam Biswas)
Dept. of Physics, Ramananda College,
Bishnupur, Bakkura.



Countersigned


15/9/08

(PRINCIPAL)
(Dr. A.K. Biswas)
Ramananda College,
Bishnupur (Bankura).

**Principal,
Ramananda College,
Bishnupur, Bankura**



THE UNIVERSITY OF BURDWAN

GOLAPBAG, BURDWAN 713 104

WEST BENGAL

INDIA

PHONE (0342) 556-549, 556-566,
562-554 EPABX Extn. 423

Department of Physics

Prof. S. K. Pradhon,

14.8.06.

To whom it may concern

This is to certify that the entire experimental works related to the U&C minor project entitled "Microstructure characterization of Nano Crystalline Materials by x-ray Diffraction" were carried out in the X-rays and Crystallography Laboratory of the Dept. of Physics of the University of Burdwan under my supervision as a co-investigator of the project.

S.K. Pradhon.

(S.K. Pradhon)



RAMANANDA COLLEGE
P.O. - BISHNUPUR, DIST - BANKURA.

Ref: F.PSW - 87 / 03-04 dated 15.07.2005

Title : Minor Research Project - in Science (In favour of Dr. Goutam Biswas)
Department of Physics

UTILISATION CERTIFICATE

It is certified that the grant of Rs.12,000/- (Rupees twelve thousand only) received from the University Grants Commission, Eastern Regional Office Kolkata, for Minor Research Project - in Science, vide their release memo no. F.PSW-087/03-04 (ERO) dated 15.07.2005, has been utilised as per terms and conditions of the sanction, details in enclosed audited accounts. The grant has been utilised fully for the purpose for which it was sanctioned.

Dated, Bankura,
The 4th day of June, 2006.

Principal

apatoa
For D. Patra & Co.
Chartered Accountants



RAMANANDA COLLEGE
BISHNUPUR, BANKURA.

PROJECT TITLE : MINOR RESEARCH PROJECT - IN SCIENCE
(IN FAVOUR OF DR. GOUTAM BISWAS)
(DEPARTMENT OF PHYSICS)

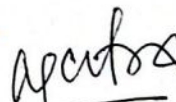
RECEIPTS AND PAYMENTS ACCOUNT
FOR THE PERIOD FROM 12.09.2005 TO 10.04.2006.

<u>RECEIPTS</u>	<u>Rs.</u>	<u>P.</u>	<u>PAYMENTS</u>	<u>Rs.</u>	<u>P.</u>
Opening Balance			By Contingency	5,163.50	
Cash in hand		1.00	" Purchase of Chemicals	4,810.00	
Grant received from UGC Minor Reserch Project. (Memo No. - PSW - 087 / 03 - 04 (ERO) dated - 15.07.2005)	12,000.00		" Travelling on Field work	5,021.00	
" Own Contribution	2,993.50		" Closing Balance	nil	
<u>Total Rs.</u>	<u>14,994.50</u>		-	<u>Total Rs.</u>	<u>14,994.50</u>

AUDITORS REPORT :-

We have examined the above Receipts and Payments Account (Minor Research Project - in Science) of Ramamanda College, P.O. - Bishnupur, Dist. - Bankura (W.B.) for the period ending 31.03.2006 and certify that the accounts has been correctly drawn up in accordance with the books of accounts maintained and vouchers produced before us.

Dated, Bankura,
The 4th day of June, 2006.


For D. Patra & Co.
Chartered Accountants

