

# **INSERVICE TRAINING PROGRAMME IN CHEMISTRY AT + 2 LEVEL FOR ALL INDIA SAINIK SCHOOL TEACHERS**

**21st May to 9th June 1990**

## **A REPORT**



**REGIONAL COLLEGE OF EDUCATION, MYSORE-570 006**  
(National Council of Educational Research & Training, New Delhi)

**INSERVICE TRAINING PROGRAMME FOR ALL INDIA SAINIK  
SCHOOL TEACHERS IN CHEMISTRY AT +2 LEVEL**

**Sainik School, Kazhakootam  
Trivandrum 695 585  
Kerala**

**FROM 21 MAY TO 09 JUNE 1990**

**Venue : Sainik School  
Kazhakootam  
Trivandrum 695585  
Kerala**

**R E P O R T**

**REGIONAL COLLEGE OF EDUCATION, MYSORE 6  
(National Council of Educational Research & Training,  
New Delhi)**

<b>Course Director</b>	:	Coln. H.S.Sangha Principal Sainik School Kazhakootam Trivandrum 695 585 Kerala												
<b>Academic Coordinator of the Programme</b>	:	Dr.G.T.Bhandage Lecturer in Chemistry Regional College of Education Mysore 570006												
<b>Local Coordinators</b>	:	Mr.M.Premnadh Mr.Rajan K.Varghese Mr.N.G.Babu Ms.M.G.Stella Mary Department of Chemistry Sainik School Kazhakootam Trivandrum 695 585												
<b>Resource Persons</b>	:	<table><tr><td>1. Dr.A.S.Janardan</td><td>7. Dr.C.P.Joshua Professor and Head Department of Chemistry</td></tr><tr><td>2. Dr.G.T.Bhandage</td><td></td></tr><tr><td>3. Dr.B.S.Raghavendra</td><td>8. Dr.C.Prabhakaran Professor of Chemistry</td></tr><tr><td>4. Dr.T.J.Vidyapathi</td><td></td></tr><tr><td>5. Dr.J.Seetharamappa</td><td>9. Dr.Rajasekharan Nair Professor of Chemistry</td></tr><tr><td>6. Dr.P.M.Radhakrishna</td><td></td></tr></table>	1. Dr.A.S.Janardan	7. Dr.C.P.Joshua Professor and Head Department of Chemistry	2. Dr.G.T.Bhandage		3. Dr.B.S.Raghavendra	8. Dr.C.Prabhakaran Professor of Chemistry	4. Dr.T.J.Vidyapathi		5. Dr.J.Seetharamappa	9. Dr.Rajasekharan Nair Professor of Chemistry	6. Dr.P.M.Radhakrishna	
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Regional College of Education (NCERT) Mysore 570006		Kerala University Trivandrum Kerala												

**Report on the Inservice Training Programme  
for +2 Level Science Teachers of Sainik Schools  
conducted at Trivandrum**

Inservice teacher training is one of the important responsibilities entrusted with NCERT, New Delhi as a part of its National Level educational activities. Inservice training programmes are vital in teaching profession since the teacher has to keep in pace with ever expanding frontiers of knowledge. The new curriculum in science at +2 level introduced by NCERT in 1989 deals with certain modern areas of science. It is imperative that the teachers are oriented to teach these aspects more effectively with appropriate teaching strategies. Keeping in view with this demand, National Sainik School Society, New Delhi requested NCERT to conduct an inservice training programme for +2 level teachers of Chemistry from all the Sainik Schools in India. In response to this request, the faculty members of Chemistry from RCE, Mysore were assigned the academic responsibilities to conduct the training programme organised by Sainik School, Kazhakootam, Trivandrum during 21st May-9th June 1990. Six faculty members of Chemistry Department from RCE, Mysore were deputed as resource persons in two phases and three Professors of Chemistry from Kerala University were invited as external resource persons.

The programme was inaugurated by Coln.H.S.Sangha, Principal, Sainik School, Kazhakootam. In his inaugural address, Coln. Sangha briefed the objectives of the programme highlighting the importance of short-term refresher courses - which are unique to the teaching profession to update oneself to the frontiers of science. Mr.V.S.Gopalan, Field Adviser, NCERT,

Kerala State spoke in brief about the role of NCERT in teacher-training programmes of the country.

While briefing the design of the academic programme for the workshop, the Course Coordinator called on the active interaction of the participants through academic discussions with resource persons. He further stressed that it is an opportunity for them to share their views and project their problems in teaching the current +2 level chemistry curriculum. The time-table comprised of three lecture-cum-discussion classes in forenoon sessions and the afternoon sessions were devoted to laboratory activities, screening of chem study films followed by discussions.

A visit to Titanium Factory, Vikram Sarabhai Space Research Centre and Thumba Equatorial Rocket Launching Station was arranged on 25th May 1990. The participants had an opportunity of observing various chemical processes carried in the laboratories and discussing with the scientists engaged in the research.

On the day of valedictory, the Registrar, Cap. R.K.Nair presided over the function, who spoke in brief about the necessity of periodic refresher courses for the school teachers and gratefully acknowledged the work done by the resource team of RCE, Mysore and Kerala University. The Headmaster of the school, Mr.K.Madhavan Nair also addressed the participants. Dr.A.S.Janardhan who spoke on behalf of the Resource Team,

described the genesis of the inservice programmes and summarised the work done during three weeks at Sainik School, Kazhakootam. The participants expressed their appreciation of the programme and desired to have more opportunities of this kind to get themselves updated in the subject as well as methodologies of teaching at +2 level. At the end of the programme, the participants were given certificates for having completed the training successfully.

**Academic Coordinator**

**Inservice Teacher Training Programme at +2 level in Chemistry  
at Sainik School, Trivandrum**

**21.5.1990 to 9.6.1990**

**Time-Table**

Day/Date	Forenoon Session			Afternoon Session	
	9.00 a.m. - 10.00 a.m.	10.00 a.m. - 11.00 a.m.	11.30 a.m. - 12.30 p.m.	2.30 p.m. - 3.30 p.m.	3.45 p.m. - 5.00 p.m.
Monday 21.5.90	Registration/Inauguration			B R E A K  L U N C H	Enquiry with participants/views about +2 level new curriculum in Chemistry
Tuesday 22.5.90	States of Matter-I (GTB)	Atomic Structure- I (BSR)	Purification and Characterisation of Organic com- pounds (PMR)		Screening of Chem. Study films and post-film discussions
Wednesday 23.5.90	States of Matter II (GTB)	Atomic Structure II (BSR)	Nomenclature of Organic Com- pounds (PMR)		Laboratory Session
Thursday 24.5.90	States of Matter III (GTB)	Atomic Structure- III (BSR)	Bonding & Struc- turing of Orga- nic compounds (PMR)		Laboratory Session
Friday 25.5.90	Visit to Titanium Factory, Vikram Sarabhai Space Research Rocket Launching Station				Centre and Thumba Equatorial
Saturday 26.5.90	States of Matter IV (GTB)	Periodicity (BSR)	Stereochemistry (PMR)		Laboratory Session
Sunday 27.5.90		States of Matter V (GTB)	Periodicity (BSR)		

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Day/Date	Forenoon Session				Afternoon Session	
	9.00 a.m. - 10.00 a.m.	10.00 a.m. - 11.00 a.m.	11.30 a.m. - 12.30 p.m.		2.30 p.m. - 3.30 p.m.	3.45 p.m. - 5.00 p.m.
Monday 28.5.90	Chemical Bonding I (BSR)	States of Matter - VI (GTB)	Hydrocarbons (PMR)	B R E A K  L U N C H	Laboratory Session --	
Tuesday 29.5.90	Chemical Bonding II (BSR)	Thermodynamics - I (GTB)	Alkyl & Aryl halides (PMR)		Laboratory Session --	
Wednesday 30.5.90	Chemical Bonding III (BSR)	Thermodynamics - II (GTB)	Molecules of Life (CPJ)		Thermodynamics III (GTB) --	
Thursday 31.5.90	Carbonyl compounds I (TJV)	Lanthanides (JS)	Surface Chemistry I (MRN)		Carbonyl compounds II (TJV)	Nuclear Chemistry (JS)
Friday 1.6.90	Carbonyl compounds III (TJV)	Nuclear Chemistry II (JS)	Surface Chemistry II (MRN)		Laboratory Session --	
Saturday 2.6.90	Carbonyl compounds IV (TJV)	Chemistry of p-Block I (JS)	Chemical Equilibrium I (MRN)		Post-Lab. Discussions --	
Sunday 3.6.90	Library Session					



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Day/Date	Forenoon Session				Afternoon Session	
	9.00 a.m. - 10.00 a.m.	10.00 a.m. - 11.00 a.m.	11.30 a.m. - 12.30 p.m.		2.30 p.m. - 3.30 p.m.	3.45 p.m. - 5.00 p.m.
Monday 4.6.90	Carboxylic acids & their deriva- tives I (TJV)	Coordination compounds I (CPP)	Electrochemistry (ASJ)	B R E A K  L U N C H	Laboratory Session -	
Tuesday 5.6.90	Electrochemistry II (ASJ)	Chemical Equi- librium II (MRN)	Coordination com- pounds II (CPP)		Screening of Chem. study films and post-film discussions	
Wednesday 6.6.90	Electrochemistry III (ASJ)	Chemistry of p- block II (JS)	Carboxylic acids & their derivatives II (TJV)		Laboratory Session --	
Thursday 7.6.90	Reaction kine- tics I ( ASJ)	Carboxylic acids & their deriva- tives III (TJV)	Organo-metallics I (CPP)		Post- Lab. Discussions --	
Friday 8.6.90	Primary Struc- ture of Proteins (TJV)	Chemistry of non-metals (JS)	Reaction Kinetics II (ASJ)		Reaction Kinetics III ( ASJ) --	
Saturday 9.6.90	Solutions (MRN)	Organo- metallics II(CPP)	Discussion/ Valedictory			

### LIST OF RESOURCE PERSONS

#### From RCE, Mysore

ASJ : Dr.A.S.Janardhan  
GTB : Dr.G.T.Bhandage  
BSR : Dr.B.S.Raghavendra  
TJV : Dr.T.J.Vidyapathi  
JS : Dr.J.Seetharamappa  
PMR : Dr.P.M.Radhakrishna

#### From Kerala University, Trivandrum

MRN : Prof.M.Rajasekharan Nair  
CPP : Prof.C.P.Prabhakaran  
CPJ : Prof..C.P.Joshua

**Units of Chemistry at +2 Level Considered for  
Lecture-cum-Discussion Classes**

1. Atomic Structure
2. States of Matter
3. Purification and characterisation of organic compounds
4. Nomenclature of organic compounds
5. Structure and shapes of Hydrocarbons
6. Chemical Families - periodic properties
7. Bonding and molecular structure
8. Energetics and chemical Thermodynamics
9. Stereochemistry of organic compounds
10. Hydrocarbons
11. Alkyl and Aryl halides
12. Carboxylic acids and their derivatives
13. Primary structure of proteins
14. Chemical Equilibrium
15. Surface Chemistry
16. Chemical Kinetics
17. Solutions
18. Molecules of Life
19. Lanthanides
20. Nuclear Chemistry
21. Chemistry of p-block elements
22. Electrochemistry
23. Coordination compounds
24. Organometallics
25. Chemistry of non-metals

**Laboratory Activities Conducted and  
Post-lab Discussions on**

1.    a)    Classification of organic compounds based on solubility behaviour  
      b)    Determination of m.p/B.p. of organic solids and liquids  
      c)    Paper chromatography of coloured pigments ink  
      d)    Thin layer chromatography of leaf and flower pigments
2.    Determination of pH of acids and bases and fruit juices
3.    Rates of evaporation of liquids at different temperatures and determination of activation energy.
4.    The effect of temperature on solubility and determination of heat of solution
5.    Study of equilibrium between  $\text{Fe}^{3+}$  and  $\text{SCN}^-$  and determination of equilibrium constant
6.    Investigatory approach for the analysis of anions and cations in a given mixture
7.    Reaction of some organic functional groups
8.    Half-cell reactions - Activity series
9.    Iodination of acetone - kinetics of reaction
10.   Preparation of  $\text{As}_2\text{S}_3$  sol. - effect of addition of electrolytes
11.   Reaction between sodium thiosulphate and HCl - effect of concentration and temperature

### **List of Films Screened followed by Discussions**

1. Hydrogen Atom - A quantum mechanical view
2. Gases and how they combine
3. Chemical Bonding
4. Introduction to reaction kinetics
5. Mechanism of an organic reaction

### **List of Instructional Materials given to the participants**

1. Investigatory projects in chemistry, RCE, Mysore, 1985.
2. Objective-based teaching and testing in chemistry, RCE, Mysore by - K.N.Tantry, A.S.Janardhan and V.Kesavan
3. Structure and description of f-orbitals
4. Synthesis, nomenclature of trans-uranium elements - man made elements
5. Rules of IUPAC nomenclature of organic compounds
6. Laboratory instructional materials
7. Copies of extracts from study guide for chemical principles - by Dickerson, Gray, Darenbourg and Darenbourg, IV Ed. 1984

## PARTICIPATING SCHOOLS AND PARTICIPANTS

### Names of Participants

### Participating Schools

1. M.Premnadh
2. Rajan K. Varghese
3. N.G.Babu
4. M.G.Stella Mary

1. Sainik School  
Kazhakootam  
Trivandrum 695 585  
Kerala

5. Mrs.Kaveta Prakash
6. Mr.Dibyendu Maiti

2. Sainik School  
Tilaiya,Tilaiyadarn  
Hazaribagh  
Bihar 825 413

7. Mr.Uzman Ali
8. Mr.N.P.Singh
9. Mrs.K.Manimegalai

3. Sainik School  
Imphal, P.B.No.21,  
Imphal  
Manipur 795 001

10. Mr.K.R.M.Karuppiah
11. Mr.P.Chandran

4. Sainik School  
Amaravathi Nagar  
Coimbatore 642 102  
Tamil Nadu

12. Mr.S.Ramaswamy

5. Cordite Factory Higher  
Secondary School  
Aravankadu  
Nilgiris 643 202

13. Mr.S.Vishnu Murthy
14. Mr.V.Srinivasa Rao

6. Sainik School  
Korukonda  
Vizianagaram 531 214  
Andhra Pradesh

15. Mr.S.N.Agarwal
16. Mr.S.S.Ahwwalia

7. Sainik School  
Kapurthala  
Punjab 144 601

Names of Participants

Participating Schools

- 17. Mr.H.S.Rathi
- 18. Mr.M.L.Jaitly
- 19. Mr.R.C.Thyagi

- 8. Sainik School  
Chittorgorh  
Rajasthan 312 001

- 20. Mr.H.C.Giri

- 9. Sainik School  
Bhorakhal  
Nainital 263 156  
Uttar Pradesh

- 21. Mr.B.K.Gupta
- 22. Mr.Kashmir Singh

- 10. Sainik School  
Kunjpura, Karnal  
Haryana 132 023

- 23. Mr.B.B.Maheshwari

- 11. Sainik School  
Balachadi  
Jamnagar  
Gujarath 361 230

- 24. Mr.Supriya Battacharya

- 12. Sainik School  
Purulia  
Manguria  
West Bengal 723 149

- 25. Mr.C.Y.Badiger
- 26. Mr.G.Sreerama Murthy

- 13. Sainik School  
Bijapur  
Karnataka 586 102

- 27. Mrs.Subha Kesavan

- 14. Demonstration School  
Regional College of  
Education (NCERT)  
Mysore 570006

- 28. Mr.G.L.Patil
- 29. Mr.A.H.Jadhav

- 15. Sainik School  
Satara  
Maharashtra 415 001

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**Names of Participants**

**Participating Schools**

30. Mr.R.A.Khan

16. Sainik School  
Goalapara  
Rajapara  
Assam 783 133

31. Mr.Pawan Sharma

17. Sainik School  
Sujanpurthira  
Hamirpur 176 100  
Himachal Pradesh

32. Mr.K.S.Guleria

33. Mr.K.C.David

18. Sainik School  
Rewa 486 001  
Madhya Pradesh

34. Mr.M.V.Narayanan

19. Govt. M.G. College  
Andrott  
Union Territory of  
Lakshadweep 682551

35. Mr.R.V.Muralidhar

20. Sainik School  
Bhubaneswar  
Orissa 751 005

36. Mr.K.C.Hati

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