

Subject : Chemistry Practical - 6
(For T. Y. B.Sc. Sem. - 6)

ISBN No. : 978-93-5236-053-6

1st Edition : 2016

2nd Edition : 2017

3rd Edition : 2018 (Revised)

Published by :

Bharat & Company,

Dr. Yagnik Road,

Rajkot - 360 001

Contact : 90990 27279

© All rights are reserved by the publisher.

This book is in copyright. Subject to statutory exception and to the provision of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Publisher.

Price.: ₹ 70/-

CHEMISTRY

PRACTICAL - 6

B.Sc. Sem. - 6

(Saurashtra Univ. 2012)

M. G. Borisagar, Ph.D.

*Assistant Professor, Department of Chemistry,
H. & H. B. Kotak Institute of Science, Rajkot.*

Yvonne Fernandes, Ph.D.

*Prin. & Associate Professor, Department of Chemistry,
Christ College, Rajkot.*

K. D. Ladva, Ph.D.

*Head & Associate Professor, Department of Chemistry,
Sri M. & N. Virani Science College, Rajkot.*

S. K. Joshi, Ph.D.

*Assistant Professor, Department of Chemistry,
H. & H. B. Kotak Institute of Science, Rajkot.*

J. J. Upadhyay, Ph.D.

*Associate Professor, Department of Chemistry,
M.V.M. Science & Home Science College, Rajkot.*

Heena K. Tilavat

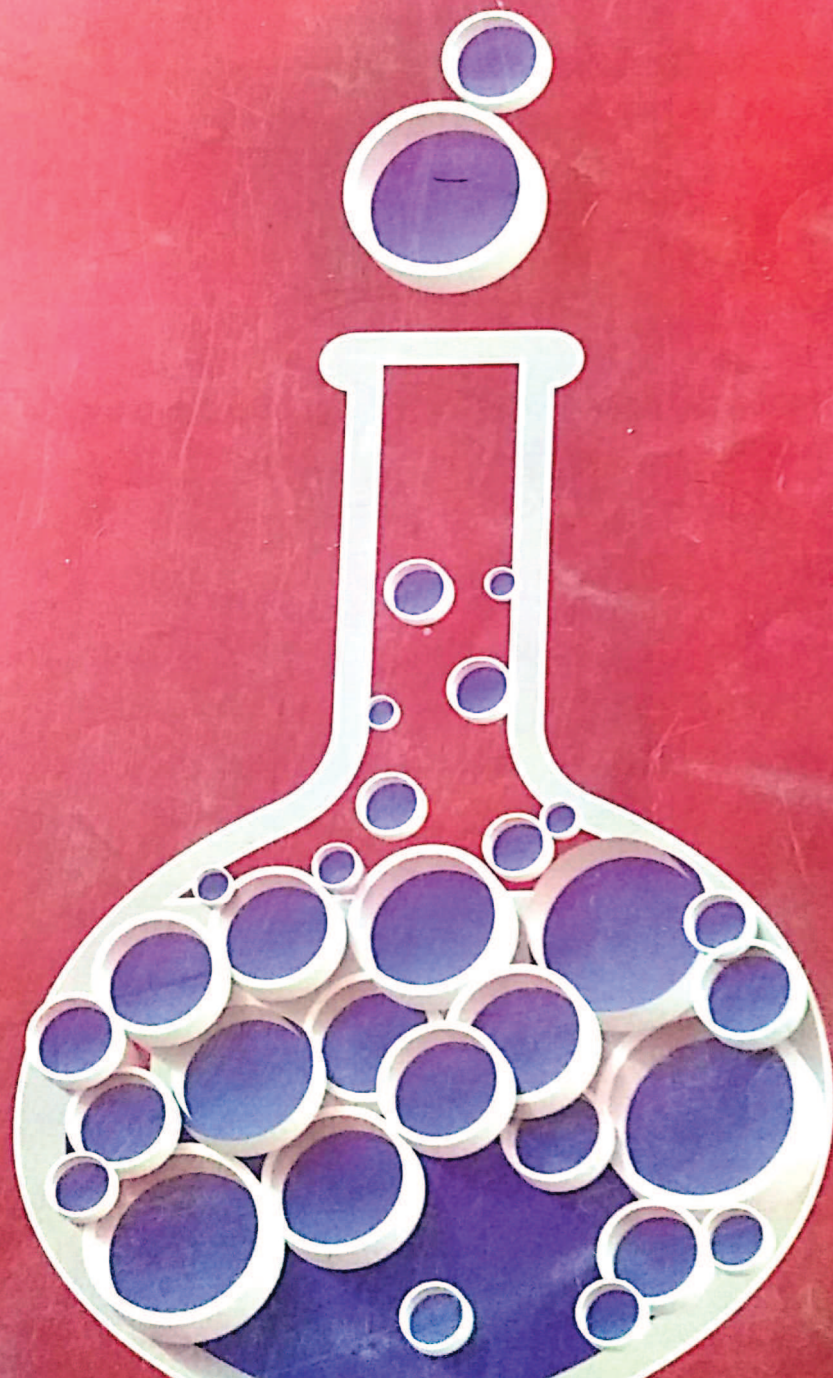
*Assistant Professor, Department of Chemistry,
T. N. Rao Science College, Rajkot.*



BHARATI

PUBLISHING HOUSE

CHEMISTRY PRACTICAL - 6



JYOT
PRAKASHAN

AUTHORS
Dr. J. M. Parmar
Dr. K. M. Kapadiya
Dr. S. K. Joshi

CHEMISTRY

Semester - V

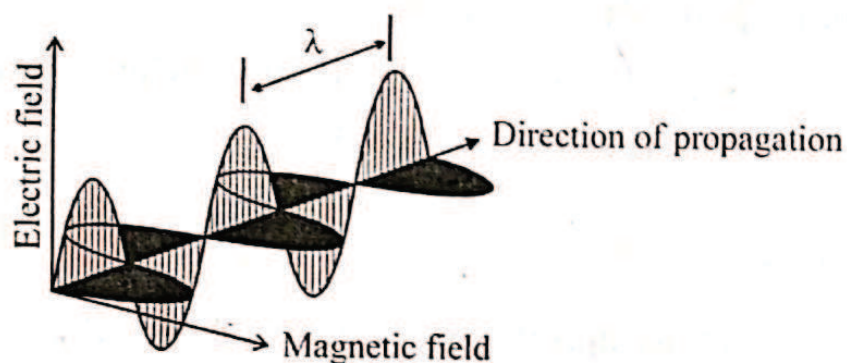


Paper - 502

CHEMISTRY

Semester - 5

Paper - 502



Dr. J. M. Parmar

I/C Principal, M. M. Science College, Morvi

Dr. K. M. Kapadiya

School of Science

Department of Chemistry, RK University, Rajkot

Dr. S. K. Joshi

Former Head, Department of Chemistry

H & H B Kotak Institute of Science, Rajkot

Jyot Prakashan

Opp. Mohandas Gandhi High School, Rajkot

It gives us great pleasure to present this book on Chemistry for the students of semester-I paper - 502. The book covers all the topics as per the syllabus of Saurashtra University and Bhakt Kavi Narshinh Mehta University. Every care has been taken that all topics be presented in a lucid language so that the students can grasp the subject easily.

We are thankful to Jyot Prakashan to give us this opportunity and rendering all support in bringing out this publication. Thanks are also due to the type setting staff in particular to Mr. Nitin Mehta for the wonderful type setting and the printers without their help such a nice publication would not be possible.

-Authors

Publisher: Jyot Prakashan

Opp. Mohandas Gandhi High School, Rajkot

M: 9429098586, 9426327205

First Edition - 2018

Price: Rs. 150/-

Printers: Nav Prabhat Printing Press, Ahmedabad

All rights reserved by the authors

No part of this publication can be reproduced in any form or by any means without the prior permission of the authors

ISBN: 978-81-936413-5-4

I N D E X

Unit-I

- | | |
|---|-----|
| 1. Name Reaction, Rearrangements and Reagents | 001 |
| 2. Alkaloids | 010 |

Unit-II

- | | |
|---|-----|
| 3. Carbohydrates | 041 |
| 4. Synthetic Drugs, Dyes and Sweetening agent | 082 |

Unit-III

- | | |
|--|-----|
| 5. Synthesis of Heterocyclic Compounds Containing Two Hetero Atoms | 089 |
| 6. Ultraviolet Spectroscopy | 098 |

Unit-IV

- | | |
|-----------------------|-----|
| 7. Molecular Symmetry | 123 |
|-----------------------|-----|

Unit-V

- | | |
|--------------------------|-----|
| 8. Infrared Spectroscopy | 153 |
|--------------------------|-----|

7.

Molecular Symmetry

-Dr. S. K. Joshi

Introduction:

Symmetry commonly exhibited in nature which provides countless examples of symmetry which is used in every field of activity. *Symmetry is the beauty of nature and it reflects the equality of uniformity* and that creates flowers, planets, tree leaves etc. all are symmetrical. Symmetry is present all over the world.

Symmetry helps to understand molecular structure, some physical properties, chemical properties and identification of molecular shape, hybridisation, etc..

Symmetry elements and symmetry operations with illustrations:

Symmetry operations are carried out with respect to a centre, a plane or an axis which are symmetry elements. These all are geometrical entity.

There are main five types of elements:

- (1) Identity [E]
- (2) Proper Rotational axis [C_n]
- (3) Plane of symmetry [σ]
- (4) Centre of symmetry [i]
- (5) Improper Rotational axis [S_n]

Such a movement of molecule that bring it to its equivalent or identical position by reflection, rotation or inversion which are called symmetry operations. e.g.

- (1) Rotation about an axis through an angle θ
- (2) Reflection carried out in a plane.
- (3) Inversion on a centre.

[1] Identity : (I / E)

“Doing Nothing”, or rotate molecule at 360° is called Identity. It is symbolised by “E”. All molecules have identity [E].

