This book compiled with a special emphasis on the application of spectral and analytical data in the development and characterization of pharmaceuticals. This book provided to of illustrated examples for better understanding of spectral applications, and also it will enhance the knowledge and working skills of the learners. This book also covered advanced techniques of current pharmaceutical industry interests such as XRD, Raman Spectroscopy, LC-MS/MS, LC-NMR, q-NMR, SEM/TEM etc. Thus, this book is formulated for the first time on the concept of spectral interpretation based on illustrated applications in real time research, and it will definitely attract young researchers, scholars, graduate students belonging to the

#### About the Author

Ramalingam Peraman, M. Pharm., PhD., he received PhD degree in Pharmaceutical Sciences, from Andhra University, India. Currently he is working as Professor and Director (Research) at Raghavendra Institute of Pharmaceutical Education and Research (RIPER) — Autonomous (NAAC & NBA (UG) accredited, certified as SIRO by DSIR. During his tenure of 16 years of experience, he served as faculty of medicinal chemistry at Gulf Medical University, UAE (2014-16). He received 3 research grants from AICTE, DST-SERB, and BIRAC-GYTI with worth of 65 lakhs in the area of synthetic and semi-synthetic drugs for drug resistant anti-tubercular drugs and antimicrobial resistance (AMR). He has more than 100 papers in indexed journals, 42 scientific deliveries in conferences/FDP/QIP across India, guideship for 4 PhD and 36 PG scholars, one Indian patent, one book, one book chapter on AQbD (Elsevier) in the area of medicinal chemistry and analytical methods. He is an awardee of GYTI Appreciation award 2016, Member Board of Studies (Pharmacy) for JNT University Anantapur, President - IPA-Local branch (Anantapur, 2017-2019).

Y. Padmanabha Reddy, M. Pharm., PhD, F.I.C., awarded PhD degree in Pharmaceutical sciences, from Andhra University, India. Having 28 years of experience, currently he is serving as Principal and Professor at Raghavendra Institute of Pharmaceutical Education and Research (RIPER) – Autonomous (NAAC & NBA (UG) accredited, certified as SIRO by DSIR) since 2002. He received best PhD thesis Award from Andhra University, conferred fellowship by Association of Biotechnology and Pharmacy, and he received 2 research grants, one Indian patent, FDP, STTP from AICTE/UGC, on natural product chemistry. He has more than 125 papers in indexed journals, 60 scientific presentations, Chairpersonship for many National and International conferences, guideship for 17 PhD and 88 PG scholars in the area of analytical methods and biological screening of pharmaceutical products. He was member Board of Studies (Pharmacy) for JNT University Anantapur, Academic advisory committee to SK University, immediate President - IPA-Local branch (Anantapur, 2015-2017). He has visited more than 6 countries on International events.

### PharmaMed Press

An import of Pharma Book Syndicate

A Unit of BSP Books Pvt. Ltd.

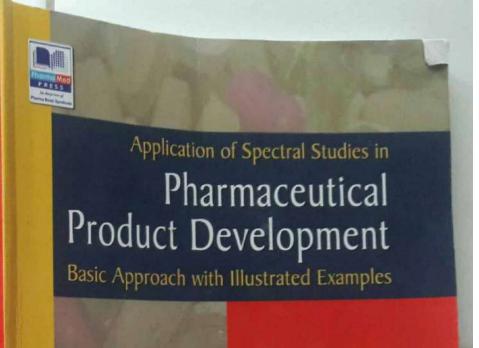
4-4-309/316. Ginraj Lane. Sultan Bazar. Hyderabad - 500 09: Phone. 040 - 23445688, 23445600. Fax. 91+40-23445611

E-mail info@pharmamedpress com, info@bspbooks net www.pharmamedpress.com, pharmamedpress.net

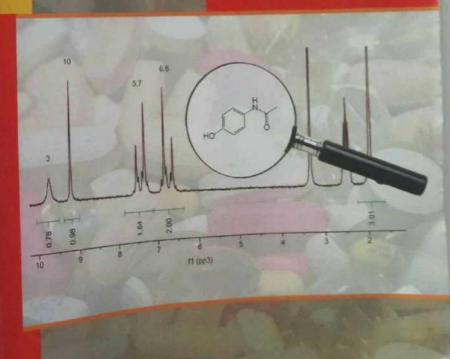




P Ramalingam | Y P Keddy



Ramalingam Peraman Y. Padmanabha Reddy



Application of Spectral Studies in Pharmaceutical Product Development (Basics Approach with Illustrated Examples) by Ramalingam Peraman and Y. Padmanabha Reddy

© 2019, by Publisher, All rights reserved.

No part of this book or parts thereof may be reproduced, stored in a retrieval system or transmitted in any language or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of the publishers.

#### Published by



# **PharmaMed Press**

An imprint of Pharma Book Syndicate

A unit of BSP Books Pvt. Ltd.
4-4-309/316, Giriraj Lane, Sultan Bazar, Hyderabad - 500 095.

Phone: 040-23445600, 23445688; Fax: 91+40-23445611
e-mail: info@pharmamedpress.com
www.pharmamedpress.com/pharmamedpress.net

Printed at
Aditya Offset Process (I) Pvt. Ltd.
Hyderabad.

Price: Rs. 250.00

ISBN: 978-93-8830-585-3 (Paperback)

## **FOREWORD**



Prof. C. K. Kokate M. Pharm., PhD

I am delighted to know that Dr. P. Ramalingam and Dr. Y. Padmanabha Reddy have jointly made their effort to bring out this book entitled "Application of Spectral studies in Pharmaceutical Product development (Basics Approach with Illustrated Examples)". I am extremely happy to write foreword, because the book is the first of its kind where the authors emphasized to compile various applications of spectral studies in pharmaceutical research.

I am amazed to see the explanations are illustrated with pharmaceutical products and absolutely filled with updated applications of Spectral studies including UV, IR, Raman, NMR, ESR and Mass spectroscopic techniques. In addition, authors have also added principle and instrumentation of few recent sophisticated techniques such as LC-MS/MS, LC-NMR, q-NMR, SEM/TEM etc.

I feel this book should be a better choice for young researchers, PG and UG students belonging to the disciplines of pharmaceutical, life and chemical sciences.



Dr. B. Suresh
M. Pharm., PhD

The Book titled ""Application of Spectral Studies in Pharmaceutical Product Development (Basics approach with illustrated examples)" brought out jointly by Dr. P. Ramalingam and Dr. Y. Padmanabha Reddy, is compiled several chapters under suitable headings, keeping in view of development of pharmaceuticals which brought the revolution in human health. In view of pharmaceutical development, the analytical techniques are serving as quality indicators throughout the life

cycle of the drugs. The goal of this book is rightly pointed by authors to apply the spectral and result data with illustrated examples to various analytical techniques in the assessment of product formation and characterization using SEM/TEM, LC-MS/MS and LC-NMR.

I am glad that authors have made every attempt to create a document which meets all the needs of application and is different approach of presentation which will help all learners including researchers from industry and academia.