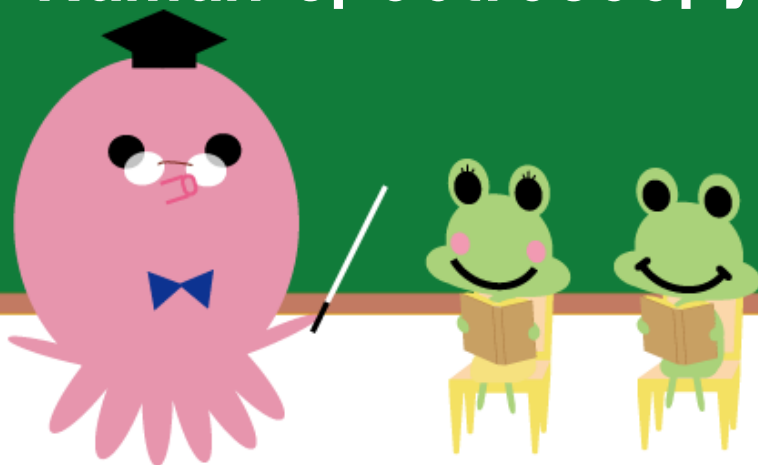


りことパス

理工学図書館パスファインダー

Raman spectroscopy



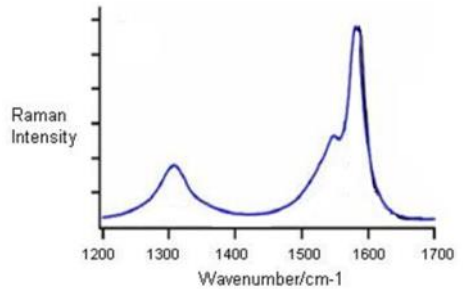
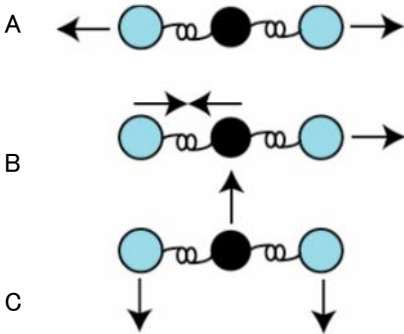
りことパスは、主に理工学分野の授業に関連するトピックについて、学習の初めの一步になる資料やWebサイトを紹介するテーマ別調べ方ガイドです。作成は理工学図書館のティーチング・アシスタント(TA)です。学習やレポート作成に活用してください。

1. Introduction



Raman spectroscopy is a spectroscopic technique used to observe molecular vibrational, rotational, and other low-frequency modes. When laser light interacts with molecular or a system, it results energy shifted up or down. The shift in energy gives information about the system vibrational modes.

Example vibrational modes of CO₂:



The Raman shift of “mode A” = Raman: 1335 cm⁻¹

History

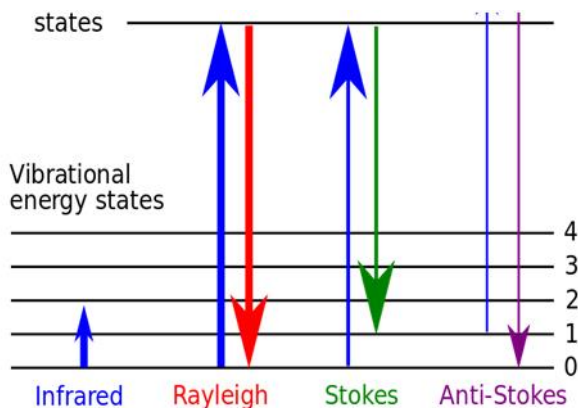


The Raman effect was named after one of its discoverers, the Indian scientist Sir C. V. Raman who observed the effect by means of sunlight.

Raman won the Nobel Prize in Physics in 1930 for this discovery that was accomplished using sunlight. He found that a small amount of light had changed frequency.

Raman effect:

- When light is in contact with material there is a change in wavelength.
- This phenomenon is now called Raman scattering.



Energy level diagram showing the states involved in Raman signal.

2. Materials



Books

■レーザラマン分光法による半導体の評価 / 河東田隆著

【書誌ID=2002224233】 理工学図書 428.8/K

This book contains information about how to use RAMAN spectroscopy technique to optimize the performance and reliability of laser.

■ラマン分光法 / 浜口宏夫, 平川暁子編

【書誌ID=2003123558】 理工学図書 433.5/HAM

The contents of this book is the basic concept of Raman spectroscopy in Japanese having a small introduction and history, and also the theoretical of Raman microscopy, and at the end some of useful application.

This book is good reference for a fast understanding of this technique.

■*Infrared and Raman spectroscopic imaging* / edited by Reiner Salzer and Heinz W.

Siesler 【書誌ID=2004124474】 理工学図書 433.57/SAL

In this book the cover the RAMAN spectroscopy near infrared. The instrumentation was mentioned. It going in details throws the vibration spectroscopy and way of imaging. Also, it contains biology and medical use as applications and how to perform imaging. In addition to food and agriculture analysis using this technique.

■ *Surface-enhanced raman scattering : physics and applications / Katrin Kneipp, Martin Moskovits, Harald Kneipp (eds.)*

【書誌ID=2003690526】 理工学図東館1F図書 420.4/TOP/103

This book contain the basic information of SERS theoretical studies and some of the application was reported.

WEB & References

■ **【Web】Wikipedia** “Raman spectroscopy”

http://en.wikipedia.org/wiki/Raman_spectroscopy

This web page goes throw an introduction of Raman and spectroscopy basics, in addition to the history and information needed. Also it has a lot of references and literature that is very important to understand RAMAN spectroscopy.




■ **【Web】Wikipedia** “C. V. Raman”

http://en.wikipedia.org/wiki/Chandrasekhara_Venkata_Raman

This web contains background of V. Raman and the concept of the-ory development by “Chandrasekhara Venkata Raman”. It can help understand well this spectroscopy technique, and also understand the logic behind this phenomenon.



図書名・雑誌名の後に【書誌ID】(10桁の数字)があるものは、大阪大学で所蔵しています。この書誌IDで、大阪大学OPAC(蔵書検索システム)を検索することができます。

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