高分解能分子分光学的手法を活用した生体機能とくに情報伝達の機構の解明

メタデータ	言語: Japanese
	出版者:
	公開日: 2021-11-05
	キーワード (Ja):
	キーワード (En):
	作成者: 大橋, 信喜美, Ohashi, Nobukimi
	メールアドレス:
	所属:
URL	https://doi.org/10.24517/00063462

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 International License.

2004 Fiscal Year Final Research Report Summary

Study on biological mechanism, specially, information transmittance by malting use of high resolution spectroscopic method

Research Project

Project/Area Number

14340177

Research Category

Grant-in-Aid for Scientific Research (B)

Allocation Type

Single-year Grants

Section

一般

Research Field

Physical chemistry

Research Institution

Kanazawa University

Principal Investigator

OHASHI Nobukimi Kanazawa University, Graduate School of Natural Science & Technology, Professor, 自然科学研究科, 教授 (40019493)

Co-Investigator(Kenkyū-buntansha)

HIROTA Eizi The Graduate University for Advanced Studies, Emeritus Professor, 教授 (30011464)
KAWASHIMA Yoshiyuki Kanagawa Institute of Technology, Faculty of Engineering, Professor, 工学部, 教授 (60131009)
FUJITAKE Masaharu Kanazawa University, Graduate School of Natural Science & Technology, Assistant Professor, 自然科学研究科, 助教授 (40212188)

Project Period (FY)

2002 – 2004

Keywords

peptide molecules / large amplitude vibration / internal rotation / microwave spectrum / Fourier transform spectrum / two-top molecules / three-top molecules

Research Abstract

In the present project, a nozzle-jet Fourier transform microwave (ETTMW) spectrometer was newly constructed in Kanazawa University, and the FTMW existing already in Kanagawa Institute of Technology was revised. Using these two FTMW spectrometers, and also using the instrument in National Institute of Standards and Technology (NIST) of U.S,A. through collaborative work, pure rotational spectra of peptide molecules and other molecular species involving large-amplitude motions were investigated to obtain information on intra-moleculaar interactions useful for understanding mechanism of biological information transmittance. Molecular species studied in the present

project are dimethyl methylphosphonate, N-methylpropionamide, N-methylformamide, N-methylacetamide, 1,1-dimethylsilacyclobutane, N-methylaniline, N,N-dimethylacetamide, Ar-dimethyl ether complex, Ne-dimethyl ether complex etc. For examples, a transition probability relating to transmittanee of the three CH_3-internal rotations occurring through Coriolis interaction between overall-rotation and internal-rotation was obtained for the N,N-dimethylacetamide, and a contribution to a rotational constant of the interaction between CH_3-internal rotation and ring-puckering motion was determined for the 1,1-dimethylsilacyclobutane molecule. Information involved in these quantities is useful, which are considered to be strongly related to information transmittance of fiologically related molecules.

Research Products (10 results)

All 2005 2004 2003

All Journal Article

[Journal Article] Fourier transform microwave spectra and ab initio calculation of N-ethylformamide 2005

[Journal Article] Fourier transform microwave spectra and ab initio calculation of N-ethylformamide 2005

[Journal Article] Fourier transform microwave spectroscopy of 1,1-dimethylsilacyclobutane. Interplay of two types of large amplitude motions : two-top internal rotation and ring puckering 2004

[Journal Article] Analysis and fit of the Fourier-transform mocrowave spectrum of the two-top molecule N-methylacetamide 2004

[Journal Article] Fourier transform microwave spectroscopy of 1,1-dimethylsilacyclobutane. Interplay of two types of large amplitude motions : two-top internal rotation and ring puckering 2004

[Journal Article] Analysis and fit of the Fourier-transform mocrowave spectrum of the two-top molecule N-methylacetamide 2004

[Journal Article] Dynamical structure of peptide molecules : Fourier transform microwave spectroscopy of N-methylpropionamide 2003

[Journal Article] Line assignments and global analysis of the tunneling-rotational microwave absorption spectrum of dimethyl methylphosphonate 2003

[Journal Article] Dynamical structure of peptide molecules : Fourier transform microwave spectroscopy of N-methylpropionamide 2003

[Journal Article] Line assignments and global analysis of the tunneling-rotational microwave absorption spectrum of dimethyl methylphosphonate 2003

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-14340177/143401772004kenkyu_seika_hokoku_

Published: 2006-07-10