ne Review of Physical Cherbistry of Varian Vol. 49 No. 2 (1979)

THE

REVIEW OF PHYSICAL CHEMISTRY

OF JAPAN

Founded in 1926

CONTENTS

Hironobu Kubota , Sadahiro Tsuda, Masahiro Murata, Takeshi Yamamoto,	
Yoshiyuki Tanaka and Tadashi Makita: Specific Volume and	
Viscosity of Methanol-Water Mixtures under High Pressuse	9
Hiroshi Kashiwagi, Tomiaki Fukunaga, Yoshiyuki Tanaka, Hironobu	
Kubota and Tadashi Makita: Dielectric Constant and Density of	
Cyclohexane-Benzene Mixtures under High Pressure7	0
Katsumi Maeda, Masaru Nakahara, Kimihiko Hara and Jiro Osugi:	
Optically Determined Mesomorphic Transitions in Cholesteryl Stearate	
at High Pressure	5
Yoshihiro Taniguchi and Keizo Suzuki : Pressure Effect on Micellar	
Formation of Sodium Dodecyl Sulfate in Saturated Aqueous Solution of	
Naphthalene9	1
Hisayuki Inoue: The Reaction of Nitrile with α -Hydrogens at High	
Pressure III. Pressure Effects on the Rates of the Iminoether Formation	
and Proton/Deuteron Transfer Reaction of Substituted Phenylaceto-	
nitriles in Methanol9	5
Tsutomu Asano: A New Method to Estimate the Intrinsic Term in Activation	
and Reaction Volumes10	9
Masaru Hongo: Initial Density Dependence of Viscosity of Nonpolar-Polar	
Gaseous Mixtures	n

THE REVIEW OF PHYSICAL CHEMISTRY OF JAPAN

(Butsuri-Kagaku no Shinpo) Found in 1926

President: Wasaburo Jono

Members of Council:

Michio Okamoto (Chief)

Jiro Osugi Ryozo Goto Renpei Goto Eiji Suito

Hiroyuki Hatano

Board of Editors:

Kyoto University J. Osugi (Chief)

R. Goto (Associate) Kyolo Sangyo University

) Maisuru Technical College E. Suito (#

Yokohama University S. Shida

Kyoto Technical University H. Teranishi

Ritsumeikan University K. Suzuki

University of Osaka K. Kuwata

University of Osaka S. Seki

Osaka City University R. Fujishiro

Profectural University of Osaka T. Hayakawa

Prefectural University of Osaka Y. Kubokawa

S. Tsuchihashi Osaka Institute of Technology

Kobe University T. Makita Okayama University

K. Monobe

Doshisha University K. Shimizu

Baika Women's College H. Togawa

Secretary:

M. Sasaki

K. Hara

M. Nakahara

N. Sumi

February 20, 1980

Communications to the Editor should be addressed to Board of Editors, The Physico-Chemical Society of Japan, Faculty of Science, Kyoto University, Kyoto, Japan.

Business Correspondences should be addressed to: Secretary. The Physico-Chemical Society of Japan, Faculty of Science, Kyoto University, Kyoto, Japan.

Purchase Order should be addressed to: Maruzen Co., Ltd., Nihonbashi, Chuo-ku, Tokyo, Japan

Published by

THE PHYSICO-CHEMICAL SOCIETY OF JAPAN

(Nippon Butsuri-Kagaku Kenkyu Kai)

Faculty of Science, Kyoto University, Kyoto, Japan

Printed by KAWAKITA PRINTING CO., LTD., Kyoto, Japan



Like a fishes'eye, Kobe Steel regards the world in a wider perspective.

Not content with
being just a major iron
and steel manufacturer,
Kobe Steel has diversified
into various technical fields,
from chemicals to nuclear power generation.

And with this accumulated experience and technical know-how, Kobe Steel has successfully undertaken complete plant construction projects, from initial

plant construction projects, from initial feasibility studies through construction to post operational management, in both advanced and developing nations.

Furthermore, Kobe Steel is utilizing its vast technological resources to tackle major urbal and environmental problems, such as industrial and community waste disposal, pollution control, recycling of materials etc.

Kobe Steel's vision encompasses a great deal more than iron and steel.



Tekko Bldg., 1-chome, Marunouchi, Chiyoda-ku, Tokyo, Japan Phone: (03) 218-7111 Telex: 222-3601 KOBSTL J

Commemorative Issue of Volume 50, 1980

The Review of Physical Chemistry of Japan

The Physico-Chemical Society of Japan has published the Review of Physical Chemistry of Japan for the past five decades; the next issue is just fiftieth. In commemoration of the fiftieth volume, we have a special plan. A number of distinguished researchers will be invited to write review papers in the next issue which has a subtitle, "Modern Aspects of High-Pressure Physical Chemistry". Those who want to submit contributed papers are also welcome; see the address on the cover. The commemorative volume will be distributed all over the world more widely than ever. The Editors wish the commemorative volume would become a milestone for the progress in the high-pressure physical chemistry.

five Osugi— Editor in chief

The Review of Physical Chemistry of Japan

Vol. 49, 1979

CONTENTS

No. 1

Masaru Hongo: Initial Density Dependence of Gas Viscosity	1
Masaru Hongo: Viscosity of Propylene under Pressures	11
Kiyoshi Shimizu and Noriaki Tsuchihashi: Pressure Effect on Conductance	
of Aqueous Solutions of Potassium Halides	16
Toshihiro Nakayama: Pressure Effect on the EDA Complexes in Solution	25
Yoshimasa Takezaki, Koichi Watanabe, Yoshiyuki Tanaka and Akira	
Nagashima: Some Evaluated Thermophysical Properties of Gaseous	
Ethyne	39
Tsutomu Asano: On the Volume Increase During Cyclization	56
No. 2	
Hironobu Kubota, Sadahiro Tsuda, Masahiro Murata, Takeshi Yamamoto,	
Yoshiyuki Tanaka and Tadashi Makita: Specific Volume and Viscosity	
of Methanol-Water Mixtures under High Pressure	59
Hiroshi Kashiwagi, Tomiaki Fukunaga, Yoshiyuki Tanaka, Hironobu	
Kubota and Tadashi Makita: Dielectric Constant and Density of	
Cyclohexane-Benzene Mixtures under High Pressure	70
Katsumi Maeda, Masaru Nakahara, Kimihiko Hara and Jiro Osugi:	
Optically Determined Mesomorphic Transitions in Cholesteryl Stearate	
at High Pressure	85
Yoshihiro Taniguchi and Keizo Suzuki: Pressure Effect on Micellar	
Formation of Sodium Dodecyl Sulfate in Saturated Aqueous Solution of	
Naphthalene	91
Hisayuki Inoue: The Reaction of Nitrile with α -Hydrogens at High	
Pressure III. Pressure Effects on the Rates of the Iminoether Formation	
and Proton/Deuteron Transfer Reactions of Substituted Phenylaceto-	
nitriles in Methanol	95
Tsutomu Asano: A Method to Estimate the Intrinsic Term in Activation and	
Reaction Volumes	109
Masaru Hongo: Initial Density Dependence of Viscosity of Nonpolar-Polar	
Gaseous Mixtures	120

Published by

THE PHYSICO-CHEMICAL SOCIETY OF JAPAN

Faculty of Science, Kyoto University, Kyoto, Japan

Example of Application with EMAX-1000 + SEM



Photo 1:700 fold enlargement of an IC. The lower part shows the line analysis of Al. The electron Beam is scanned over the line (scanning time: 80 sec.).



Photo 2: The plan analysis of Photo 1 showing Al distribution.



Photo 3: Background is removed by contrast enhancer.

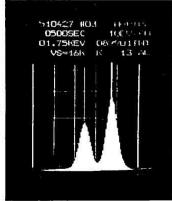
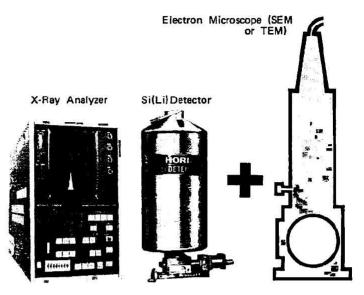


Photo 4: The X-ray analysis of the area shown in Photo 1.
The brighter peak is the window-set Al.
The adjacent peak is Si.

Simultaneous qualitative analysis of multi-elements (11Na-92U) in a few tens of seconds.



X-ray Micro-Analysis System

HORIBA MODEL EMAX-1000 SERIES X-RAY ENERGY DISPERSIVE ANALYZERS

Each of HORIBA Model EXAM—1000 SERIES X-RAY ED ANALYZER for X-ray micro-analysis is a system for simultaneously, speedily and easily analyzing a multiple number of elements of a substance in a small area, by assembling it together with your electron microscope of SEM or TEM type. Extremely reliable. No personal error. Non-distructive. Consists of a high-resolution Si(Li) X-Ray Detector, a Pulse-Height Analyzer and a Video Display.

MAIN APPLICATIONS

bio-assey studies.

Qualitative analysis in the fields of metal and mineral industries, chemical industries and electronic industries. Fixing the elements in biochemical and Objects: Characteristic X-rays of elements from "Na (sodium) to "LU (uranium).

System of Measurement: Energy- Dispersive Method by Si(Li) X-Ray Detector.

Energy Resolution:
Less than F.W.H.M. 162eV (MnKa Line 5.9keV, 1000 cps)



A group of specialists in HORIBA, Ltd. also offers an engineering service encompassing an overall system in order to maximize the performances of your X-ray analyzer system.



HORIBA, Ltd.

Head Office:

Miyanohigashi, Kisshoin, Minami-ku, Kyoto,

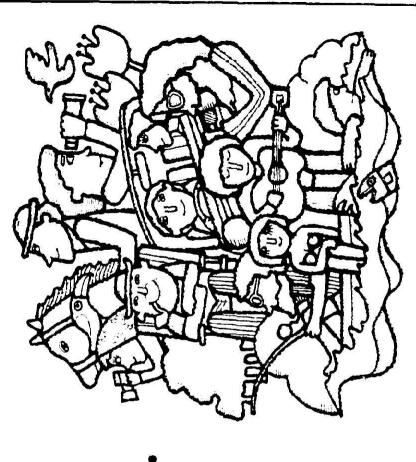
Japan

Phone: (075) 313-8121

Cable Add.: HORIBA KYOTO / Telex: 5422130

We serve.... Many peoples, Many lands, Many ways.

SYNTHETIC RESINS & PLASTICS INDUSTRIAL CHEMICALS FERTILIZERS DYESTUFFS AGRICULTURAL CHEMICALS MEDICINES CONSTRUCTION AND BUILDING MATERIALS



MITSUI TOATSU CHEMICALS, INC.

2-5, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo, Japan Cable: "MITSUITOATSU TOKYO"

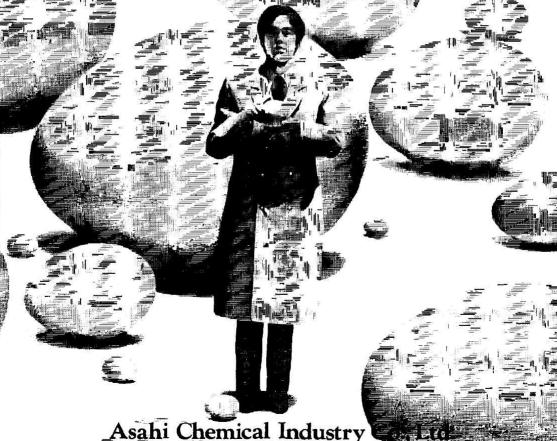
Felex: Call No.0222-3622 Answer Back Code (MTCHEM J)

Like the goose that laid the golden eggs, Asahi Kasei is producing many things for your needs.

To make life better for everyone,
Asahi Kasei produces all kinds of fibers
and filaments to make the clothes you
wear . . . draperies, carpets, wall
coverings, blankets . . . tire cords for your
automobile. We're in the food business
with natural food flavoring and
seasoning . . . frozen foods like
hamburgers and meat balls. Skyscrapers
use Asahi autoclaved lightweight concrete.
We care for your health with medical

equipment, medicines, artificial kidneys.

Asahi Kasei products also include
plastics of all kinds,
synthetic rubber, fertilizers, starting
materials and intermediates, ion
exchange membranes for a non-polluting
method of producing caustic soda,
photosensitive resins for the printing
industry. Our research engineers are
working on more new products to make
your life easier and happier.



Tel: (06) 347-3111 Telex: 523-3811 (BEMBRG J) Cable: BEMBRG OSAKA