The Review of Physical Chemistry of Japan Vol. Hand (1974)

Vol. 44, 1974

THE REVIEW OF PHYSICAL CHEMISTRY of Japan

Founded in 1926

CONTENTS

| Kaoru Date : Evaluation of P-V-T Properties Data, The Most Probable Values of Compressibility Factor of Propane and Propene |
|--|
| Izumi Ishihara, Kimihiko Hara and Jiro Osugi : Pressure Effects on the |
| Complexes of Cobalt (II) Chloride and Cobalt (II) Bromide in Acetone Solution1 |
| Tateo Arimoto and Jiro Osugi: The Charge-Transfer Interaction and Successive |
| Thermal (2+2) Cycloaddition of α , β - Unsaturated Ethers with Tetracyanoethylene2 |
| Takeshi Fujii : Kinetic Studies on the Rearrangement of N-Chloroacetanilide under |

Pressure

THE PHYSICO-CHEMICAL SOCIETY OF JAPAN

THE REVIEW OF PHYSICAL CHEMISTRY OF JAPAN

(Butsuri-Kagaku no Shinpo)

Found in 1926

| President: Wasaburo Jono | |
|--------------------------|---------------------------------|
| Members of Council: | |
| Michio Okamoto (Ch | ief) |
| Jiro Osugi | |
| Ryozo Goto | |
| Renpei Goto | |
| Eiji Suito | |
| Hiroyuki Hatano | |
| Board of Editors: | |
| J. Osugi (Chief) | Kyolo University |
| R. Goto (Associate) | Kyoto Sangyo University |
| E. Suito (//) | Kyolo University |
| S. Shida | Yokohama Univeristy |
| H. Teranishi | Kyoto Technical University |
| K. Suzuki | Ritsumeikan University |
| K. Kuwata | University of Osaka |
| S. Seki | University of Osaks |
| T. Imeto | Osaka City University |
| R. Fujishiro | Osaka City University |
| T. Hayakawa | Prefectural University of Osaka |
| Y. Kubokawa | Prefectural University of Osaka |
| S. Tsuchihashi | University of Kobe |
| T. Makita | University of Kebe |
| S. Hasegawa | Okayama University |
| K. Shimizu | Doshisha University |
| H. Togawa | Doshisha University |
| Secretary : | |

Se

- K. Hara
- M. Nakahara

1

J. Nakaji

September 30 1974

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

1

20

'Dai-el[®] is a highly fluorinated elastomer, which can be easily -vulcanized by amines, peroxides, irradiation and etc., to produce the •cured product with excellent thermal stability, resistance to oils, solvents, chemicals, ozone and weathering, high mechanical strength and non-inflammability. Major uses: Packings, gaskets, diaphrams, expansion joints, O-rings, sheets, hoses, gloves etc.

Enquiries to: Daikin Kogyo Co Ltd Chemical Division, Head Office. Shin Hankyu Bldg 8 Umeda Kitaku Osaka Japan. Fluorochemical activities: Daikin is the biggest manufacturer of fluorochemicals in Japan and produces on a commercial scale chemical products such as hydrofluoric acid.

fluorocarbon refrigerants (Daiflon Gas), fluorocarbon polymers, fluorocarbon agricultural chemicals, benzotrif.uoride and its derivatives and many other fluorochemicals,



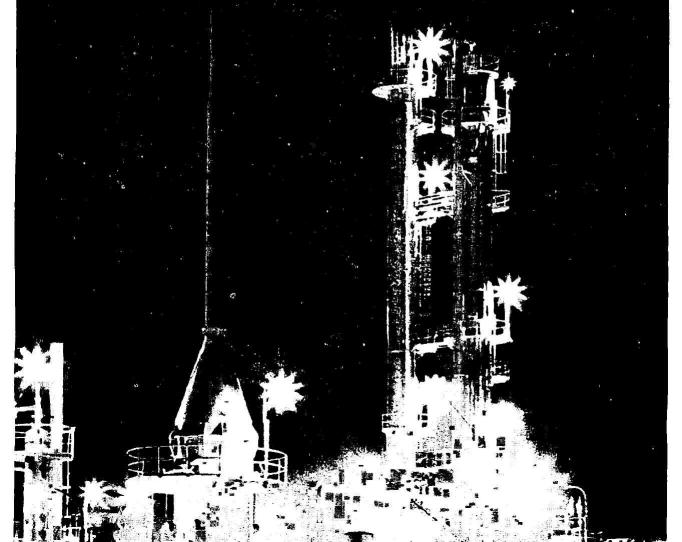
KKA INTIFIKA s

products and technologies shall be at your service

KANEKA has now firmly secured its leading position in Japan's chemical industry, and enjoys a high international reputation not only for its capability of offering unique; high-quality products in quick succession but also for its establishment of technical know-how in various field of technology. KANEKA's unique, high-quality products are as follows ... " Kanekalon," a self-extinguishing modacrylic fiber and is booming for its suitability and nonflammability for carpets; curtains and wigs. "Kane-Ace B," PVC modifier, is now in brisk world-wide demand. "PVC Dispersion Resin," "Heat Resistant PVC," "Expandable Polystyrene," and so on. A variety of epochal projects are now under way at our 10 laboratories far ahead in the same field both at home and abroad.

- * KANEKA's per capita sales and profit are ranked as one of the highest among all chemical manufacturers in the world, thanks to our very high productivity.
- * KANEKA's products have, for the most part, originated in its own laboratories.
- * 55% of KANEKA's products have been developed on its hands for the first time in Japan.

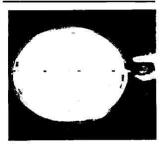




HORIBA'S HIGH-PURITY SYNTHETIC CRYSTALS

for precision optical measurements of radiation, infrared, ultraviolet or lasor beam.

Nal (TI) SCINTILLATOR



HORIBA, Ltd. has established a steady production line for large size crystals of greater than 12 inches by diameter in addition to conventional size crystals.

The photograph at right shows an Nal (T \$)Scintillator for use with scintillation camera. The large diameter Nal (T \$) scintillator enabled scintillation survey of an extensive area to be done in a drastically shorter time. HORIBALtd. is ready to respond to your requirements for any purpose as for as the scintillators are concerned.

i - A

INFRARED RAY OPTICAL CRYSTAL



Infrared ray optical crystal is formed from materials specially refined for optical crystals as melted and grown into a huge size ingot. Its uncontested high purity, exact crystal lattice and transparency at the transmission range are universally acknowledged.

The crystal is available in forms of prism, window or lense of either rough-polish or rough-cut block, or in a random size.

Materials : LiF, NaCL KCL KBr. CsL AgCL CaF2, KRS-5, etc.

ELECTRO-OPTIC CRYSTAL



HORIBA.Ltd. is the first in Japan to have developed electro-optic crystal, known as DKDP single crystal especially for modulation of lasor beam. The electro-optic effect of the crystal has been greatly expanded by replacing hydrogen in KDP crystal by its isotope, deuterium (maximum deuterium replacement : 99.7%)

Electro-Optical Crystals

| | Pachols lades & -5468A | Noll Rom Voltage &-S461A | 2 Cel Raulten Sea |
|---------------------|---------------------------------|--------------------------|----------------------------|
| OKOP (KHI PO4) | 7. =26 4 : 10m ⁻⁴ /V | yin C | 40 : 40 : 40mm |
| 10P (130 PD-) | Y10 3 . 100 -77 | 7 YXY | 40 : 40 : 40 00 |
| ADP (TH. S. PO.) | 7 11. Ha -74 | 9 GIY | 40 x 48 x 40mm |

HORIBA, Ltd. HORIBA Miyanohigashi. Kisshoin Minami-ku. Kyoto. Japan Phone: (075)-313-8121

ALEX[®]Heat Exchangers Now Available with Super-Large Cores for LNG, SNG and NG Plants.

(But still at half the cost, with one tenth the size.)

THE PARTY OF THE PARTY

LNG, SNG and chemical plant builders, rejoice. ALEX heat exchangers from Kobe Steel, Ltd. cost about half as much and take up about one tenth the space of conventional multi-tube types, but at no loss in heat transfer efficiency. The secret isn't so secret—heat transfer area per cubic foot of equipment volume is around 1,500 square feet or eight to ten times larger than in multi-tube models.

Now available with super-large cores up to $47.2^{*}(1,200\text{ mm}) \times 47.2^{*}(1,200\text{ mm}) \times 263.8^{*}(6,700\text{ mm})$, our ALEX exchangers have fewer core connections and cause much less pressure drop. Compact size means that your plant needs a much smaller cold box.

We make them from our own special aluminum alloy to guarantee start to finish quality control. Brazed aluminum construction explains the excellent behavior at low temperatures, the high pressure resistance and the "so what" attitude toward quick temperature changes.

Plus: you get the priceless extra of Kobe Steel's expertise gained by having quite a few ALEX heat exchangers in operation at our own steel works. In other words, we won't sell you a heat exchanger that we wouldn't use ourselves. Write to the nearest agent listed below for our new ALEX catalog and our prompt delivery times.



Tokyo Office: Tekko Building, 8-2, 1-chome, Marunouchl, Chiyoda-ku, Tokyo, Japan Cable Address: "KOBESTEEL TOKYO" Phone: Tokyo (03) 218-7111 Telex: 222-3601 (KOBESTEEL TOK)



to here

or here

venture for the

processing of EVR video

cassette

tapes.

For example, the field of oil resource development. We began drilling for oil in the off-shore area of Nigeria and our very successful strike has already yielded low-sulphur crude. We have also begun exploratory drilling in Iran's Lorestan district.

In Japan, Teijin participates in a joint



But Teijin keeps going. Other areas indicative of our growing versatility: glass fiber, agricultural chemiculs, eye medicines, ophthalmic instruments, cosmetics, computer software.

For a company known to most people as a leading manufacturer of fine fashion fibers and fabrics, these activities may seem like quite a departure. But the process of diversification promises to grow.

or here

In the Malagasy Republic. Tcijin is engaged in joint ventures for the raising of cattle and production of beef and beef extract. The latter is used as a basic ingredient in many packaged food products.

Because it is Teijin's business philosophy to engage in business that promotes human welfare and social progress. We will continue to expand into new fields wherever there is a favorable business and social climate.



TEUIN LIMITED Head Office: 11, Minami-hormachi, 1-chome, Higashi-ka, Osaka 541, Japan