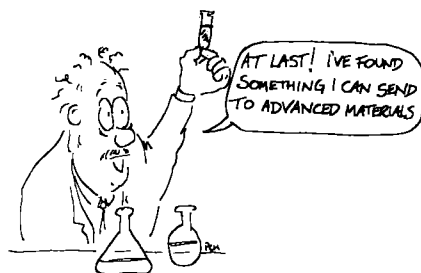


Materials Forum

Companies and individuals wishing their news and views on advanced materials issues and products to be considered for coverage in this section should send press releases, correspondence and other details, in English, to: Materials Forum, ADVANCED MATERIALS, P.O. Box 101161, D-6940 Weinheim, Federal Republic of Germany.



Conducting PPS-Compounds

The lowest electrical resistance of partially crystalline "conducting" thermoplastics previously achieved has been in the range 10^2 to 10^3 Ohm cm. Newly developed poly(phenylene sulphide) based compounds from Bayer, marketed under the trade name Tedur, combine a further reduced resistivity (to 1 Ohm cm) with high performance up to approx 200 °C and are stable at voltages of 220 V.

Additives such as metal fibers, carbon black and graphite improve the electrical properties of the polymeric materials. They are stable against oxidation and chemical decomposition and can possess a wide range of mechanical properties.

Several of the Tedur materials have been developed for antistatic applications, for example, housings in photocopiers, encapsulants for microchips or in the handling of flammable solvents. Others, of the conducting type will be applied in heating systems including preheaters for air/fuel mixtures.

Euromat '89

The Federation of European Materials Societies (FEMS) holds its first European materials conference from 22.-24. November 1989 in Aachen, FRG. The organization of the event is in the hands of the German Materials Society (DGM) and it is intended that the conference should bring together materials scientists from all over Europe and elsewhere to participate in plenary and short lectures, poster exhibitions and workshops. Six topics have been selected to form the basis of major symposia. They are: powder metallurgy, high temperature materials, materials in electronics, interface science, microscopy, and biomaterials.

The program and further information are available from DGM e.V., Adenauerallee 21, D-6370 Oberursel, FRG. Tel. (061 71) 4081. Fax (061 71) 52554.

Liquid Crystalline Polymers

Extruded bands of Polystal (a liquid crystalline polymer produced by Bayer) have a lower density than glass fiber reinforced epoxide materials and exhibit high strength and a better modulus of elasticity. Due to these properties the new reinforced materials have revolutionized the production of, amongst other things, cross country skis.

The leading world producers of cross country skis, Fischer (Ried, Austria) incorporated Polystal into 40000 pairs of skis for the 1988/89 season and have been delighted by the results. In cross country skiing it is particularly important to have good shock absorption and insulation against vibration as well as light weight and high strength.

Liquid crystalline polymers can be looked upon as self-reinforcing polymers. The macromolecules which make up these materials are aligned parallel to one another in the melt but on extrusion the materials also take on a macroscopic parallel ordering. These fiber-like materials exhibit good performance at tem-

peratures from 120 °C to those more likely to be found in a snow covered landscape.

Further information is available from Bayer AG, D-5090 Leverkusen, FRG, Tel. (0214) 30-31162.

New Man

Norwegian Talc have recently strengthened their materials business management by employing *Jens Adolf Döhle*, a chemist with experience in laser technology. Döhle took over responsibility for customer service and applications information on advanced materials in January. The Norwegian Talc program for which he is responsible includes high-purity chemicals, thin film materials especially for high- T_c superconductor work as well as materials for sputtering and CVD. This is a fast growing market area for the company which until now has concentrated mainly on Germany, Austria, and a number of Eastern-Block countries.

Crystalline Isotactic Polypropylene

The arrangement of the polymer chains in crystalline synthetic polymers is generally anisotropic. In other words, the macromolecules which make up the polymers are aligned parallel to one another. This chain-axis parallelism has become almost an unchallenged principle of polymer crystallization as it seems consistent with the packing requirements of the rods, although the polymers studied so far are almost exclusively of the fibrous type. However, in a recent article in 'Nature', *Sergio Brückner* and *Stefano Valdo Meille* of the University of Udine, and the Polytechnic of Milan, Italy, respectively, have reported a study of polymers which do not readily form fibrous specimens. They have found that the structure of isotactic γ -polypropylene comprises layers which are two chains wide, similar to the α -

phase, but with the chain axes aligned in the adjacent bilayers at an angle of 80° to one another (see figure) resulting in

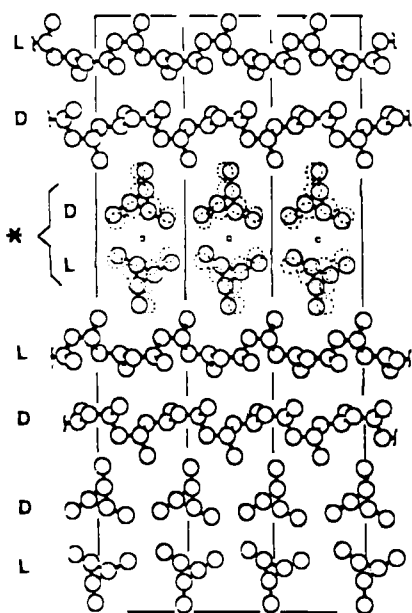


Fig. 1. Packing of γ -iPP. For the sake of clarity, coaxial anticlinal helices are shown (dashed) only for some chains. The basic features of mutual chain arrangement and methyl-group interdigitation are shown. The labels *D* and *L* refer to the chirality of the helices belonging to the corresponding layer, and an asterisk identifies a bilayer of parallel chains.

favorable registration between helices. More about the unusual structure of γ -isotactic polypropylene where the non-parallel chains appear in a fully ordered array can be found in S. Brückner, S. V. Meille, *Nature* 340 (1989) 455.

New Laser Glass

A new phosphate glass (APG-1) has been developed by Schott for use in high performance and high energy laser work. The glass is doped with neodymium and emits infrared light at a wavelength of 1053 nm. The new glass exhibits a high thermal shock stability and low thermal expansion ($\alpha = 7.6 \times 10^{-6}/K$) in the temperature range from 20 to $40^\circ C$ and is homogeneous.

Further details are available from Scott Glaswerke, Göttelmannstraße 17, P.O. Box 2480, D-6500 Mainz 1, FRG. Tel. (06131) 837328.

Quadrupole Mass Spectrometer

The QX 2000 Quadrupole Mass Spectrometer analyzes the composition of your process and residual gases – quickly and precisely. A single fingertip control lets you know immediately what gases are present in your vacuum chamber.

For ease of operation, the QX 2000 is menu driven via an integrated touch sensitive screen and uses a powerful computer (IBM AT compatible) with 640 kb RAM. Any important data can also be stored on a 3 1/2" diskette drive floppy disk for recall and use at a later time.

The QX 2000 ensures early detection of problems which could otherwise jeopardize the operational integrity or safety of a process, such as: air leaks, changes in the water content of the process atmosphere, contamination due to oil or solvents, outgassing of materials under vacuum.



Typical applications include the areas of: IC and semiconductor fabrication, thin-film deposition techniques, laser industries, space simulation, materials research.

The QX 2000 offers more than conventional quadrupole mass spectrometers: simplicity of operation via the touch screen, high-resolution color monitor (640×350 Pixel, EGA standard), trend analysis for 12 user-selected masses, over a defined period of time. The display may be linear or logarithmic, covering up to 7 decades.

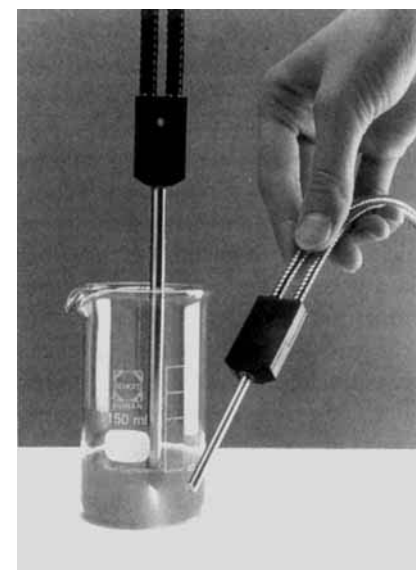
For further information please contact: Mr. M. Wasiletschko LEYBOLD, Bonner Strasse 498, D-5000 Köln 51, FRG, Phone: (0221) 347-1168 or in Great Britain: Mr. J. Holford, Phone: (01) 947 9744.

Materials Science in Bayreuth

The University of Bayreuth (FRG) in a northern area of Bavaria known as Oberfranken, has filled the first of three chairs in materials science which are to be the basis of the new Institute for Materials Science. Professor Günther Ziegler, previously at the German Research and Testing Establishment for Air and Space Travel (DLR) in Cologne takes up the challenge on November 1, 1989 and will be particularly responsible for the areas of ceramic composites. The other two planned chairs will be in polymer composites and metal surfaces and interfaces. The work in the institute will be applications oriented and will be based on the existing strengths of the university, solid state physics and polymer chemistry. Close cooperation with materials scientists at the University of Erlangen-Nürnberg some 85 km to the south is planned.

Fiber Optic Level Measurement

Schott have developed a level or depth measurement device for liquids based on fiber optic technology (see picture). The gauge is able to function in harsh conditions, for example, aggressive media, or in the region of explosions (highly shock



resistant), and can function at temperatures up to 200 °C. The recording and transfer of the measurement data is only affected by electromagnetic fields.

Further information is available from Schott Glaswerke, Göttelmannstraße 17, P.O. Box 2480, D-6500 Mainz 1, FRG, Tel. (06131) 837328.

Laser Power Monitor

OPHIR Optics Jerusalem Ltd., have developed a new model, the PD-2A, to add to their range of power monitors. The newest addition to the range is based on a silicon photodiode where the spectral sensitivity with a resolution of 1 nm is recorded in the memory of the compact device. The desired wavelength is selected using a 4 way switch which also sets the corresponding calibration parameters from memory.

This calibration allows an accuracy of $\pm 5\%$ over the whole spectrum (350–1100 nm) to be achieved. For higher powers, to avoid saturation of the detector, a detachable filter is supplied extending the range of the device to 2 W.

Further details are available from agents Optiglas GmbH, Boschstr. 12, D-8039 Puchheim, FRG, Tel. (089) 80 10 35.

Magnetic-Bearing Turbomolecular Pump

LEYBOLD will introduce in Europe an improved magnetic bearing turbo-

molecular pump concept designed to substantially improve pump life and virtually eliminate pump maintenance.

The bearing system consists of a combination of passive permanent magnetic bearings and only one active controlled bearing. The lubricant-free pump (the Turbovac 340 M, see figure) can be



mounted in any position desired. Its built-in power generator assures active bearing control even during electrical fluctuations or in case of complete power failure.

Highly resistant to shock and other currently known working conditions, this hydrocarbon-free pump will feature

a maintenance-free, low vibration, and low noise level operation. Other features include: stable rotational speeds at high pressures, short start up and deceleration times and bearing purge gas protection. The solid state power control has built-in process control system for RS 232/24 V interfaces, drive control for backing pumps and pump set components and is sized for 1/2 19-inch rack mounting.

For further information, please contact Otmar Reuter, phone: West Germany (0221) 347-1556 or in Great Britain, John Holford, phone: 01-947 9744.

Materials Research in Germany — Annual Report

The annual report for 1988 on projects run under the aegis of the German BMFT, the government body concerned with research and technology, has recently appeared. The report, a healthy 1600+ pages, covers the progress made in projects concerning ceramics, powder metallurgy, polymers, composites, and tribology, projects which are running both in universities and in industry. The report has been produced by the BMFT in cooperation with the PLR, the Projektleitung Material- und Rohstofforschung and is available from the PLR, KFA Jülich, P.O. Box 1913, D-5170 Jülich, FRG. Tel. (02461) 61-0.

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