

RESOURCES

A summary of new products and services for materials research...

Modeling Polymer Properties:

BIOSYM Technologies' Crystal Cell and Networks are designed to speed polymer design and development, and reduce the costs of bringing products to market. The Crystal Cell program for the atomistic modeling of crystalline polymers aids the study and characterization of crystal structure and stability. Networks, a program for calculating structural properties of polymeric networks, elastomers, and gels, uses a Monte Carlo sampling procedure and bonding algorithm for simulating the typical cross-linking or cure reactions that form gels, elastomers, adhesives, and coatings. Development of the polymer software was guided by a consortium of chemical manufacturers, government and academic research labs, and an international advisory committee of leading polymer scientists. Both programs have been used by consortium members for more than a year.

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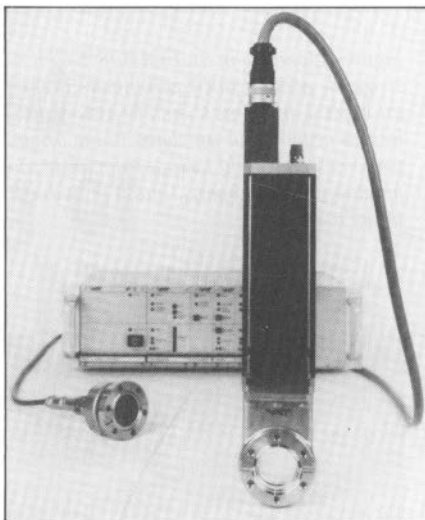
Experimental-Scale Atomizer: Compact HERMIGA-Mini inert gas atomizer from PSI can produce up to 3 kg steel of fine metal powders per batch and may be installed conveniently without special site preparation. The HERMIGA-Mini has an induction-heated furnace and features a close-coupled die design for producing powders down to 10 microns median in a clean vacuum environment. Its space-saving features will appeal to research groups and to existing powder producers seeking to augment their facilities at low cost.

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Engineering Atlas on Material Wear and Failure:

Comprehensive *Failure Atlas for Hertz Contact Machine Elements* from ASME provides detailed information on material failure in Hertz machine components including gears, ball bearings, cams, and rollers. The 412-page book classifies failure modes and includes concise, user-friendly descriptions of the possible causes of specific problems. More than 500 high-resolution photographs contributed by companies in the aerospace, nuclear, and heavy equipment industries show the degrees and variants of corrosion, cracking, and other failures. The first part of the book includes a hierarchically organized failure classification system with numeric codes and allows users to easily identify, observe, and trace specific failure modes. The second part consists of image plates illustrating erosion, surface distress, corrosion, fretting wear, and other failure modes.

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Fast-Closing Miniature UHV Gate Valves:

VAT Series 75 Mini UHV Gate Valves are capable of total sealing within 8 ms from signal detection to closure. They are ideal for use in beam lines and other applications where prevention of pressure in-rush accidents is critical. The valves seal vacuum tight against atmosphere in either direction and feature metal static seals and Viton® gate seals with a leak rate of $<1 \times 10^{-9}$ mbar \times l/s across the valve seats. The stainless steel valves, available with 2-3/4-inch CF flanges, are rated for 5,000 cycles before maintenance, and the gate and bellows can be serviced without breaking down the system. The thin profile, 1.38-inch flange-to-flange valves are bakeable to 200°C closed or 250°C open, and limit switches are a standard feature.

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Metals and Alloys Characterization Indexes:

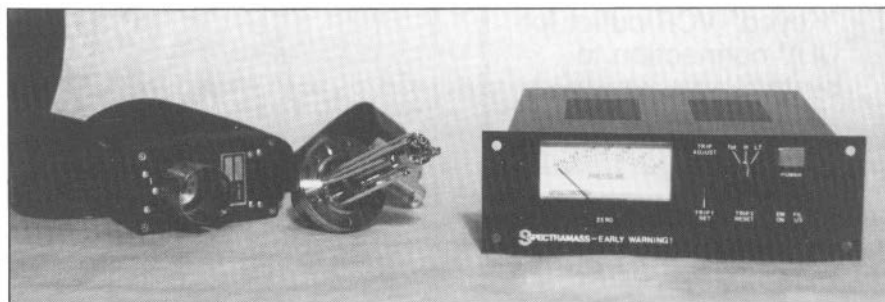
Comprehensive volume from the International Centre for Diffraction Data contains four extensive indexes designed to make the characterization of metallic and related nonmetallic materials easier and more accurate. The 750-page book follows the style of standard metallurgical references and may be used independently or in conjunction with the powder diffraction file (PDF). An alphabetical formula index allows systematic searches for chemical analogs, permits greater use of partial chemical knowledge, and includes all metals and alloys PDF materials in a format designed for rapid retrieval. The Pearson symbol code index, a structural index with quick reference codes, lists materials in Pearson symbol order to aid identification of an unknown material's structure when the unit cell is known. A common names index permits cross-referencing with appropriate PDF data, and the Strukturbericht symbol index provides cross-referencing between Strukturbericht symbols for metallic and related structures corresponding to metallurgical prototype structures in the PDF.

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Bibliography for Scanning Probe Microscopy:

Free bibliography from Park Scientific Instruments provides an extensive list of published articles on scanning probe microscopy. Produced in collaboration with Paul Bryant and Hyo S. Kim of the University of Missouri, Kansas City, the bibliography, which will be updated periodically, currently contains 886 references and a 10-page author index.

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Hydrogen/Helium Leak Detector:

The Early Warning Hydrogen Monitor from Spectramass utilizes quadrupole technology to provide three basic functions on cryopumped systems. The equipment accurately monitors the cryopump's life by monitoring the chamber's hydrogen partial pressure. It can also monitor the total

chamber pressure or function as a helium leak detector. The monitor's audio signal and output relay, which are part of the adjustable partial pressure trip level, warn operators of the need for cryo regeneration. In the helium leak detection mode, an audible warning tone is sounded.

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