

## RESOURCES

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

**ITO Coating Solution:** Chemat Technology has developed an ITO coating solution for low-temperature fabrication of transparent conductive coatings. The solution can be deposited on the substrate by spinning or dipping, and cured at temperatures around 200°C. The resulting coating is transparent and has a sheet resistance of  $10^3$ – $10^4$   $\Omega$ . The solution is suitable for preparation of transparent conductive coating as transparent electrodes and anti-static films.

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**Pulse Tube Cryorefrigerator:** Cryomech's PT4-05 produces cryogenic temperatures below 2.8 K without use of displacers. The rotary valve in the cold head directs helium gas in and out of expansion tubes, dropping the temperature to 2.8 K. The first stage is available for shield and lead cooling from 40 to 75 K. The compressor package supplies the cold head with pressurized helium through hoses. The object to be cooled is attached to the heat exchanger at the end of the cold head. Heat is carried to the compressor by the expanding helium and is discharged into cooling air or water.

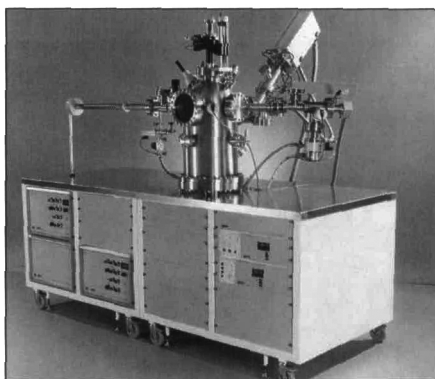
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**High-Temperature Automatic Refractometer:** Topac's DUR, from Schmidt & Haensch, is a microprocessor-controlled high-temperature refractometer covering the full Abbe range of refractive index—1.33000 to 1.70000. Refractive index measurements can be made at temperatures up to 80°C, with a precision of 0.00002 index. A recirculating fluid from a temperature-controlled bath controls sample temperature in the measurement area. An independent cooling circuit stabilizes the internal temperature of the measuring head. Operation is fully automatic, and the analysis can be displayed or downloaded to a PC or printer.

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**Metals and Materials Catalog:** Goodfellow's catalog of metals and materials lists almost 48,000 items, with information about dimensions, form, purity, and specific density for each product, as well as the material's atomic, electrical, mechanical, physical, and thermal properties. Featured are pure metals, alloys, polymers, ceramics, and composites. The catalog may be found on the Internet at [www.goodfellow.com](http://www.goodfellow.com) and is accessible in English, French, German, and Spanish.

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**SIMS Workstation:** Hidden Analytical's SIMS workstation is an integrated system for surface analyses by secondary ion mass spectroscopy. The multiport UHV analysis chamber incorporates a quadrupole analyzer with integrated energy filter and mass range to 1000 amu, together with an ion gun, FAB gun, and sample manipulator for part-per-billion elemental sensitivity and depth resolution to 5 nm. Additional mounting ports enable system expansion for multiple surface analysis techniques and customization.

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**Spin Coaters:** The RC8 THP wafer processing system from Karl Suss includes a GYRSET<sup>®</sup> spin coater, hot plate, and manual transfer arm. Configuration choices are for 8-, 5-, or 3-in. (~20.3, 12.7, and 7.6 cm) processing formats. The system can be used to develop new processes or simulate existing process in low volume. The ACS 8 Monolithography Cluster is suitable for less complex production processes. It is an automated coat/bake system for substrate sizes from 2-in. (5.1-cm) to 200-mm wafers and 3 in. through 6 in. (~7.6 cm through ~15.2 cm) square, and features modular design and automatic compensation for wafer size. Together, the RC8 THP and ACS 8 allow users to create coat-bake-develop solutions and transfer them from R&D to production.

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**Process Smooths CVD Diamond Films:** Crystallume has developed a process controlling fine grain size and uniformity of diamond films during growth, producing smooth diamond surfaces. Grain size remains constant, up to 2- $\mu$ m-thick film. The films are deposited on silicon substrates up to 8 in. (~20.3 cm) in diameter. Thickness uniformity provides variations of <5% over the entire wafer, with no graphitic phase carbon.

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**Energy Analyzer:** STAIB Instrumente's RHEA-100 is a high-energy high-resolving power energy analyzer with imaging capability and two operating modes. In one mode, complete RHEED diagrams are energy filtered and can be viewed on a fluorescent screen. In the second mode, *in situ* energy loss distributions (EELS) for selected angular ranges can be measured. The instrument offers removal of the inelastically scattered electrons and *in situ* determination of the chemical state of the surface by EELS.

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**Optics and Optical Instruments Catalog:** Edmund Scientific's 270-page catalog covers more than 10,000 optical components, video systems, laser accessories, and positioning equipment.

Products include prisms, beam splitters, filters, mirrors, optical mounts and component holders, magnifiers, microscope objectives, video zoom microscopes, video lenses, boom stands, cameras, illumination sources, lasers, optical cleaning products, magnets, and thermometers. The catalog is available in print or on the Internet at [www.edsci.com](http://www.edsci.com).

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**AMS System:** National Electrostatics in conjunction with ETH-Zurich has developed a compact AMS system for both high-throughput pharmacological radio-carbon tagged samples and high-precision archaeological carbon dating. The turnkey system fits within a 6 meter  $\times$  6 meter room. When equipped with the 134-sample multicathode SNICS source, it can process over 400 samples per day to 2% precision. Archaeological samples can be dated with a background in the  $10^{15}$  range to precision better than 0.5%. Options are available for statistical analysis in final dating determination.

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**Preamplifier:** The MTS-100 from Advanced Research Instruments amplifies pulses from photomultiplier tubes, electron multipliers, SIMS, and ISS for counting applications. It replaces an HV decoupler box, preamplifier, linear amplifier, and low-level discriminator. Featured are a high-voltage decoupling network for detection of positive or negative ions, and a low-pass filter in the HV path to lower noise on the HV line. Sensitivity is 100  $\mu$ V–200 mV for TTL output, and maximum pulse repetition rate is >50 MHz.

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