

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

Solder, Flux Specifications: Free wall chart provides technical guide for more than 60 solders and fluxes available from Indium Corporation. Solder information includes liquidus and solidus temperatures, chemical composition, plastic range, specific gravity, electrical and thermal conductivity, and tensile and bond strength. The flux chart lists maximum solder temperatures, specific gravity, flash point, solids content, water resistivity, cleaning method, tack strength, and viscosity.
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Superconductivity Report: Fourth annual *Superconductivity Progress Report* is available free from Superconductor Applications Association. The report covers 26 areas of potential applications and also includes a section on current progress in superconductor R&D and an economic forecast for the superconductor market. Background information on superconductors is described as well.
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Ballistic Electron Emission Microscope: Variable-temperature ballistic electron emission microscopy (BEEM) system from Surface/Interface provides detailed analysis of interface properties of a sample as a function of electron energy. An extension of STM, the technique can characterize buried interfaces up to 1,000 Å below the surface nondestructively in semiconductor or photonics devices, or in aerospace composites. BEEM does not require ultrahigh vacuum for optimum performance but does work best in a cold environment. The system comes with a combination of liquid nitrogen cooling and resistive heating to allow for stable, user-selected temperatures during analysis. Operators can view spectra and their derivatives individually or with the image in which they were scanned. Spectra may be located and chosen interactively even during imaging. Images of collector current vs. x-y location may be acquired and displayed or analyzed as standard images.
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Nonradioactive Replacement for ThF₄: CIROM®-IRX from CERAC can be used in a variety of coating applications ranging from low-loss laser mirrors to filter and AR coatings. The material has a refractive index of 1.4 near 10 μm wavelength, and is compatible with other layer components typically used in IR multilayer coating designs. It shows good adhesion and low stress for thick layers, and has excellent mechanical durability and moisture resistance.
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Lateral Force Microscope: Lateral force microscope (LFM) from Digital operates similarly to a conventional atomic force microscope where the vertical position of a probe-bearing cantilever is detected by laser light reflected into a position-sensitive photo-detector. The LFM also measures the lateral "torque" of the cantilever as the probe interacts with the moving sample, allowing the relative frictional characteristics of a sample surface to be mapped simultaneously with the topography. The LFM's lateral sensitivity can detect atomic corrugations on mica. It can operate in either conventional AFM or in LFM modes.
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Automated Photoreflectance Spectrometer: PC-controlled photoreflectance spectroscopy system evaluates advanced materials such as GaAs, AlGaAs, InGaAs, InP, GaP, InGaP, and InGaAsP nondestructively, without contact, and at 300 K. The cost-effective, small-footprint PRS-1000 allows precise, repeatable characterization of transition energies and band gaps in III-V materials and detection of Franz-Keldysh oscillations in an automated process. At room temperature, the PRS-1000 can measure energy levels of interband and intraband transitions within an accuracy of a few meV.
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Research Metals and Materials: Free catalog of Goodfellow's metals and materials for research and industry includes more than 3,600 items. Technical specifications and comparative data are featured for 480 pages of pure metals, alloys, polymers, ceramics, composites, and honeycombs in a wide selection of forms and sizes. Small quantities are a specialty; 48-hour delivery is standard.
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Electrochemical Scanning Probe Microscopes: Digital's NanoScope EC scanning tunneling microscope (STM) and atomic force microscope (AFM) monitor redox reactions, plating, electrofinishing, and other electrochemical processes in real time, in three dimensions, and with atomic resolution. The ECSTM houses a bipotentiostat, special low-current scan head, and electrochemistry cell. The ECAFM includes an external potentiostat fixture that attaches to the standard AFM, and an EC fluid cell. Software for both provides computer control of the potentiostat and microscope as well as simultaneous recording of both electrochemical and SPM data.
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CFE-STEM with Digital Electronics: VG Microscopes' cold field emission source scanning transmission electron microscope comes in two models: (1) the HB601UX for high spatial resolution microanalysis at the nanometer level and imaging with a point resolution of 0.22 nm; and (2) the HB601UHR for ultrahigh resolution imaging with a point resolution of 0.18 nm in Z-contrast mode. Software allows the resolution limit to extend below 0.10 nm. The control system is completely digital and provides operational simplicity for routine applications with flexibility for advanced research projects.
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Sample Preparation Equipment: South Bay Technology's free 48-page catalog provides information on equipment and supplies for cutting, polishing, crystal orientation, damage-free sample preparation, and TEM sample preparation. The catalog also describes South Bay's line of sample-preparation supplies, including diamond lapping film, diamond paste, diamond slurry, diamond spray, diamond powder, diamond wheels, and coated abrasive products for cutting and polishing virtually any material.
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Surface Analysis Components: Perkin Elmer's free 1992-93 catalog features 285 pages of items for building high-performance surface analysis systems. Included are ultrahigh vacuum equipment, test chambers, subsystems, and components. Product descriptions are as comprehensive as possible, including photos, schematics, complete descriptions, specifications, and ordering information. Contents: photoelectron and Auger electron spectroscopy; ion scattering and secondary ion mass spectrometry; photon, electron, and ion sources; electron diffraction; sample handling; computer interfaces and systems; vacuum equipment; surface analysis equipment; spare and replacement parts; customer service; and analytical laboratory services.
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Data Analysis and Manipulation Software for Surface Analysis: ESCA-Tools from Surface/Interface interfaces with all commercial ESCA and AES systems and is PC or Macintosh compatible. Brochure describes how the software can reduce complex sequences to a single command, apply the latest data reduction algorithms, bring data analysis and report writing to desktop computers, and produce publication quality reports.
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