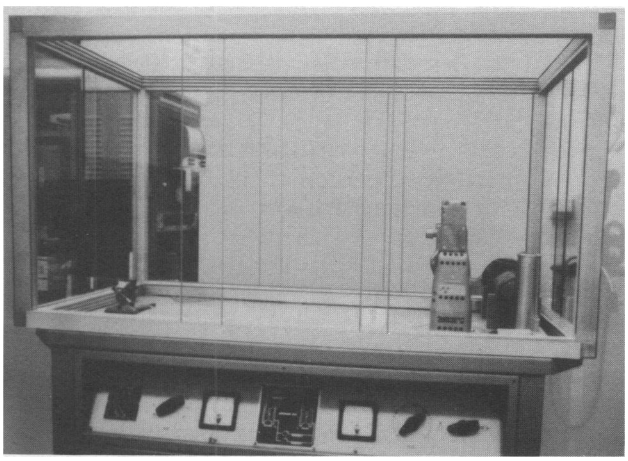
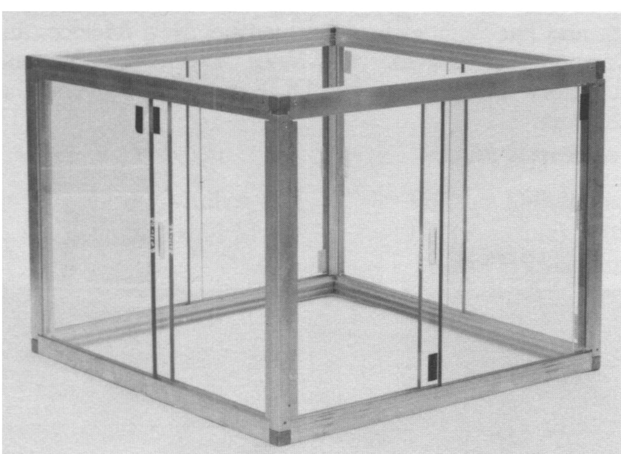
Commercial Announcements

X-Ray Diffraction Enclosures of Clear-Pb® Transparent Lead-Plastic Panels Offer Significant Benefits

Nuclear Associates, a division of Victoreen, introduces CLEAR-Pb lead-plastic panels which are ideal for use in shielding X-ray diffraction equipment. They provide working personnel with complete protection from scattered radiation, plus a crystal-clear panoramic view of the entire work area.

Because CLEAR-Pb is a lead-impregnated, transparent plastic, it combines superb light transmission and effective radiation shielding. For X-ray diffraction use, 0.3 mm lead-equivalent (7 mm thick) CLEAR-Pb panels are recommended. Any size up to 48″ × 96″ can be supplied (larger sizes and other thicknesses are available). CLEAR-Pb panels are shatter-resistant and easy to handle making them an ideal substitute for fragile lead glass where large-size transparent shielding is required.





CLEAR-Pb X-ray diffraction enclosure with sliding doors.

CLEAR-Pb can be fabricated to most X-ray diffraction configurations, and by providing transparent sliding panels, the operator has convenient and safe access to the experimental work area.

For more information, contact:
M. Ratner, Nuclear Associates
(516) 741-2166.

Philips Introduces a Rugged Powder Diffractometer Designed for Routine Analysis

The PW1800 automated X-ray powder diffractometer system from Philips Analytical is the first instrument of its kind to be designed specifically for routine qualitative and quantitative powder analysis in industry and research.

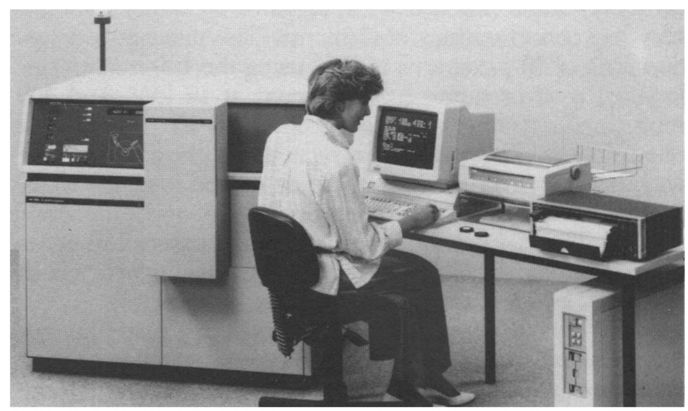
This ruggedly-built diffractometer incorporates a completely new, high precision goniometer and a compact generator — all totally enclosed in a single low-line cabinet. Its construction effectively excludes atmospheric dust and other contaminants, as well as providing the highest standards of radiation safety.

Performance Features

Superior analytical performance is achieved through a combination of advanced optical features — including long fine focus X-ray tubes, automatic divergence slits and a newly-designed diffracted beam monochromator.

High speed goniometer slewing and digital scanning allow fast data collection, while continuous or step rotation of samples improves measuring statistics.

The complete system is factory aligned and fully tested before delivery, for easy installation and assured stability.



Outstanding performance and extreme ease of operation make the Philips PW 1800 automated X-ray powder diffractometer system ideal for routine analysis in industry and research.

Powerful and Simple

With operation fully controlled by built-in microprocessor electronics, regular quality control and process monitoring measurements are readily handled by shift personnel with no special skills. Addition of an automatic sample changer enables mixed sample batches to be analysed without any human intervention.

In addition, compatibility with Philips' powerful APD 1700 diffraction software for DEC computers means that a wide range of sophisticated analytical and calculation procedures can be programmed.

For further information:

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Simultaneous Measurement of Material Properties Possible with X-ray Analyzer

A new scientific instrument that allows simultaneous measurement of X-ray fluorescence, X-ray absorption, and electron density from a material sample has been developed cooperatively by researchers at Sandia National Laboratories Livermore (SNLL) and Lawrence Livermore National Laboratory (LLNL). Called an X-ray microanalyzer, the instrument is the first that allows such measurements to be made simultaneously from the same small area of a sample. X-rays generated by the device have an effective beam diameter as small as 15 microns (a micron is one-millionth of a meter; a human hair is about 100 microns in diameter). The microanalyzer also measures X-ray diffraction properties in a separate step.

Conceptual design for the instrument came from Monte C. Nichols of SNLL's Exploratory Chemistry Division. Concept development proceeded with the collaboration of Dale Boehme of the same division and Richard W. Ryon of LLNL's Nondestructive Evaluation Section.

Nichols says there are three primary advantages of the X-ray microanalyzer over existing instruments.

(1) Existing X-ray fluorescence equipment cannot match the microanalyzer's ability to make measurements on extremely small (micron-sized) areas or its ability to detect very low concentrations of elements. The unit has a detection limit of 40 picograms of gold using the 100-micron collimator, a silver target tube powered at 12 kW, and 400 seconds of counting time. (A picogram is 10^{-12} gram, or one-trillionth of a gram, and is related to 1 gram in the same way that one drop of water would be related to all the water in an Olympic-sized swimming pool.)

(2) The X-ray beam used by the instrument can penetrate a sample, allowing non-destructive imaging of layers or structures beneath the sample surface.

(3) Biological and other non-conductive materials can be examined for the presence of elements without coating the sample with a conductive film or without examining the sample in a vacuum (necessary if electron optical techniques are used).

Located at SNLL, the microanalyzer has been applied initially to mapping changes in solid materials with respect to elemental composition, electron density, and mass thickness, with spatial resolutions in the micron realm.

The SNLL and LLNL research team says the new instrument will be useful for a variety of nondestructive evaluation applications in materials development, fabrication, and manufacturing. Other applications are expected in biology, integrated circuit development, metallurgy, and related fields.

The X-ray microanalyser uses 18-kW rotating anode X-ray source employing one of several anode materials. X-ray fluorescence data are collected using an energy-dispersive detector located close to the sample. The electron density is determined using the Compton scattering peak in the energy spectra.

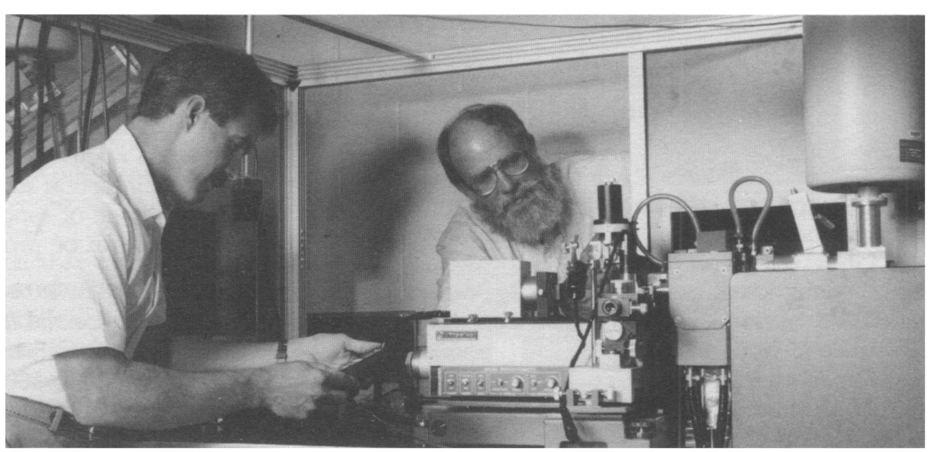
X-ray absorption measurements are made using a scintillation detector in the direct beam behind the sample. A beam splitter is used in combination with another scintillation detector to monitor and correct for any intensity fluctuations in the incident beam.

X-ray powder diffraction data are collected using a scintillation or proportional detector equipped with an annular slit.

Nichols says a microfocus X-ray tube version based on the X-ray fluorescence portion of the instrument is being developed as a commercial device by the Kevex Corp., Foster City, California.

Additional information about the X-ray microanalyzer can be obtained from Glenn W. Kuswa, Technology Transfer and Management Department 4030, Sandia National Laboratories, Albuquerque, NM 87185-5800; telephone (505) 846-4945.

Sandia National Laboratories is operated for the U.S. Department of Energy (DOE) by AT&T Technologies, Inc., and has facilities in Albuquerque, New Mexico, and Livermore, California. Lawrence Livermore National Laboratory is operated for DOE by the University of California.



Monte C. Nichols prepares to measure a material sample on the X-ray microanalyzer at Sandia National Laboratories' Livermore, Calif., facilities. Nichols did the conceptual design for the microanalyzer and collaborated on its development with Dale Boehme (left), also with Sandia Livermore, and Richard W. Ryon of Lawrence Livermore National Laboratory.