PS01.04.13 ARGONNE MODULAR CCD DETECTOR. N.E.C. Duke, I. Naday, E.M. Westbrook, Center for Mechanistic Biology and Biotechnology, Argonne National Laboratory, Argonne, IL 60439, USA

A charge-coupled device (CCD) area detector, designed and built at Argonne National Laboratory and intended for use at the Advanced Photon Source (APS), is now in the process of being characterized and tested to demonstrate the detector's performance. Data will be presented regarding progress in this characterization program. The characteristics of this detector should make it nearly ideal for protein crystallography at beamlines 19-ID and 19-BM of the APS.

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PR01.06.17 THE FIRST EXPERIMENTS OF THE 10 MHz POSITION SENSITIVE DETECTOR "OD-3". V.M. Aulchenko, Yu.S. Velikzhanin, V.M. Titov, S.A. Ponomarev, Yu.V. Usov, M.S. Dubrovin, B.P. Tolochko*, Yu.A. Gaponov*, O.V. Evdokov*. Budker Institute of Nuclear Physics, M.Lavrentev st. 11, Novosibirsk-90, 630090 Russia; *Institute of Solid State Chemistry, Kutateladze st.18, Novosibirsk-128, 630128 Russia

A history of the development of position sensitive (PS) detectors for x-ray experiments in Novosibirsk INP started since 1975. An old OD-2 modification was relatively simple device based on the proportional chamber with a delay line for the coordinate reconstruction.

The development of a new detector was started two years ago and was stimulated by the users request to improve pointed out parameters. A completely new one coordinate detector OD-3 was designed to improve the parameters of the OD-2.

OD-3 has the following parameters:

- frequency up to 10 MHz events/detector;
- angular resolution 0.009 degree (near ~100 mkm);
- parallax-free at variable focal length (from 300 mm to 450 mm without any modification and to infinite at cathode plane replacement);
- photoabsorbtion region increased up to 50 mm (and can be increase more);
- enlarged inlet window up to 200 mm x 10 mm.

In the July 1995 the OD-3 was tested at the synchrotron radiation beam line 5-b storage ring VEPP-3. From the January 1996 OD-3 is using in the time-resolved diffraction experiment for the investigation the synthesis of the $NiMoO_4$, $CaMoO_4$, the intercalation of the sodium adipate into $LiCl{\cdot}2Al(OH)_3{\cdot}nH_2O$ and reduction of the Ag from the metal-organic compounds.

PS01.11.14 THE ANALYSIS OF MACROMOLECULES UNDER AQUEOUS AND NON-AQUEOUS CONDITIONS DETERMINING THE PARTICLE SIZE DISTRIBUTION AND MOLECULAR WEIGHT DISTRIBUTION USING LOW AND RIGHT ANGLE LASER LIGHT SCATTERING AND PHOTON CORRELATION SPECTROSCOPY (PCS) DETECTION WITH SIZE EXCLUSION CHROMATOGRAPHY. Trevor Havard and Peter Wallace.Precision Detectors Inc., 160 Old Farm Road, Amherst, MA 01002 Tel 413 256 0516.

The objective of this paper is the separation and analysis of the particle size and molecular weight of macromolecules like Poly-Carbohydrates and Proteins, carried out under aqueous conditions, and macromolecules like polystyrene, star branched polystyrene and dendrimers. The paper will describe a **new instrument** that enables the molecular weight and particle size distribution to be obtained simultaneously. The paper will also describe how an instrument of this type can be used for the first time in flow mode to determine the molecular weight distribution as well as the hydrodynamic radius of the macromolecule eluting from an SEC system. This system is especially useful in determining the amount of aggregation that occurs while trying to dissolve certain macromolecular systems like carbohydrates and proteins into solution under different conditions where pH, temperature may be varied. The results show the effective use of Photon Correlation Spectroscopy (PCS) to determine aggregation, branching, and size, independent of the usual chromatographic integration and baseline user selection. The use of Photon Correlation Spectroscopy as a technique for characterizing particles is well documented. However, until now there has never been an attempt to make these important measurements in a flowing SEC system.

PS01.11.15 PICOSECOND TIME RESOLVED X-RAY DIFFRACTION FROM SINGLE CRYSTALS. P. M. Rentzepis, P. Chen, and I. V. Tomov. Department of Chemistry, University of California, Irvine, CA 92717, USA

An x-ray diode driven by picosecond 193 nm pulses has been used to generate characteristic x-ray pulses with duration less than 10 ps, at 300 Hz repetition rate. These pulses were employed in pump and probe x-ray diffraction experiments to study the transient structure of single crystals illuminated by picosecond laser pulses. The intensity of scattered x-ray radiation and its spatial distribution were recorded by a 2k X 2k CCD camera designed for direct x-ray imagining. A single Au (111) crystal was illuminated by 1.8 ps laser pulses and probed by x-ray pulses. The theory of x-ray scattering from one dimensionally strained crystal has been applied to describe the experimental results. Changes in x-ray diffraction pattern with 10 ps time resolution were observed. The application of this experimental system for picosecond and nanosecond x-ray diffraction from powder and liquid materials will be discussed.

PS02.03.19 THE VACANCY DIFFUSION IN BCC 3HE. V.V. Boiko, N V. Zuev, N.E. Dyumin, V.N. Grigor'ev, SNG, Ukraine 310164, Kharkov Lenin Avenue, 47, Ukraine.

It is study a diffusion in solid 3He using the diffusion flow through a porous membrane new method, which was elaborated and successfully employed in investigation by the authors earlier. The diffusion flow in BCC crystals of 3He is measured at the three values of molar volume. The self diffusion coefficient of 3He is determined in the temperature range 0,45 - 0,7 K, as well as vacancy diffusion coefficient which are found to be temperature independent. In the frames of the model of wide-zone quasiparticles the method is proposed for direct determination of the vacancion zone width (Δ), with using the comparison of experimental date for self - diffusion and heat capacity. The values of Δ obtained are sufficiently large than temperature giving the evidence for the legitimity of using the model of wide-zone quasiparticls.