hybridization effects has also come from polarized-beam experiments on UGe_3 (G. H. Lander et al., Phys. Rev. Letters 44, 603 (1980)) and $CeSn_3$ (C. Stassis et al., J. Appl. Phys. 50, 7567 (1979)). Our results will be discussed in light of these experiments as well as phonon and x-ray measurements on $CeSn_3$.

Finally, to achieve excellent agreement between theory and experiment, we must consider anharmonic effects, i.e., terms in the B atom potential to fourth-order in atomic displacements. For $CeSn_3$, the dominant fourth-order term is along the unique tetragonal axis, whereas for UGe_3, it produces a modulation of the potential in the x-y plane. This modulation yields a partially attractive interaction with respect to unlike nearest neighbors. The implication of these results for $AuCu_3$ near T_c will be discussed.

13.X-08 NEUTRON DIFFRACTION STUDIES OF CHEMICAL REACTIONS. By C. Riekel, Max-Planck-Institut für Festkörperforschung, 7000 Stuttgart-80, FRG.

Structural studies of heterogeneous (solid/gas; solid/liquid) reactions are usually performed on stable or metastable phases, with the aim of a high structural resolution. This approach may be quite time consuming for complicated phase sequences and it may not be possible to isolate all phases.

An alternative approach is real-time neutron diffraction which allows study of the dynamics of the structural development. Information on phase sequences and low resolution structural data are thus obtained (C. Riekel, Progr. in Solid State Chem. (1980) 13, 89). Neutrons are especially interesting for this approach as the high transmission of most materials facilitates the construction of reaction cells.

Most experiments were done on powders, and 1D-multiwire detectors were used to record the diffraction patterns. The time scale is in the range 0.5>t<15 min./spectrum. To cope with the multitude of spectra recorded, automatic peak fitting routines were developed.

The establishment of phase sequences will be shown for solid/gas reactions, i.e. the formation of KC_x, $KC_{24}(C_6D_6)_x$ and $|C_6D_4(AsF_5)_x|_n$. Examples for solid/liquid reactions are the electrochemical formation of $K_x(D_2O)_yTaS_2$ and $Li_xA\ell$.

Model calculations will be reported for $K_x(D_2O)_yTaS_2$ (stoichiometry and stabilisation of intercalate layer), D_xTaS_2 (deuteron sites).

13.X-09 NEUTRON DIFFRACTION AS A PROBE OF ADSORBED FILM STRUCTURES.* By L. Passell, Brookhaven National Laboratory, Upton, New York 11973 U. S. A.

There are cases where neutron diffraction is the technique of choice in the investigation of surface films. Applied, for example, to weakly-bound, light atom (or molecule) overlayers on substrates with large specific areas (and with single facet exposure), neutrons are often able to provide information unobtainable by more conventional methods. Thus neutrons have provided new insights into the properties of a number of overlayer phases which--by virtue of their weak interaction with the substrate--are predominantly two-dimensional in character. The general application of neutrons to surface film studies will be reviewed and illustrated by selected examples from the literature.

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13.X-10 COMMENSURATE AND INCOMMENSURATE STRUCTURES OF MONOLAYERS ON GRAPHITE. By P.M. Horn, IBM T.J. Watson Research Center, Yorktown Heights, NY 10598, USA.

We have performed a series of X-ray diffuse scattering measurements on monolayers of krypton, xenon and oxygen on the surface of exfoliated zyx graphite using both synchrotron (see e.g. R.J. Birgeneau, G.S. Brown, P.M. Horn, D.E. Moncton and P.W. Stephens, J. Phys. C (1981) 14, L49) and conventional rotating anode (see e.g. R.J. Birgeneau, E.M. Harmmonds, P. Heiney, P.W. Stephens and P.M. Horn in "Ordering in Two Dimensions" dited by S.K. Sinha (North Holland, 1980; p29)) sources. In the submonolayer regime krypton is commensurate with $\sqrt{3}x\sqrt{3}R30$ structure. As the coverage is increased krypton undergoes a hexagonal commensurate to hexagonal incommensurate transition which is at least nearly second order. At this transition the substrate-limited coherence of the commensurate monolayer (2300Å) deteriorates to less than 100Å demonstrating that liquid-like disorder is the dominant feature of the weakly incommensurate system.

In contrast to krypton, both xenon above ~70K, and oxygen above 10K, are incommensurate at all coverages. The xenon system exhibits a 2D triple point with first and possibly continuous melting.