

are measurable to  $0.02^\circ$ , but due to lack of accurate information on sample position under pressure, the limits of accuracy of meaningful data perhaps will not be this good. Since only relative measurements are needed, this problem may not be too critical. Studies of the accuracy and reproducibility are now under way in regard to this problem.

To indicate the operation and capabilities of the instrumentation, X-ray diffraction patterns obtained in the preliminary testing from a sample of KCl at various oil pressures are shown in Fig. 9. No attempt has been made to relate the oil pressure to sample pressure in this discussion since this involves the pressure calibration of the press using LiH with this particular sample geometry. This series of patterns (shown in Fig. 9) was taken to check the feasibility of detecting phase changes and determining crystal structure of a high-pressure modification. The well-known KCl volume transition reported by Bridgman at approximately 20 Kb is indicated here. The X-ray lines of the high-pressure phase are indexed to a CsCl-type structure and the Miller indices are indicated for the new phase by an asterisk. This transition is known to be very "sluggish" in its behavior and is very evident as one observes the disappearance of the lines of the low-pressure structure and the appearance of the lines of the high-pressure structure as pressure is increased. How much of this "sluggishness" is due to rate reaction or lack of adequate pressure transmission is still an unanswered question. These patterns are given here only as an indication of the quality of the obtainable patterns and the versatility of the instrumentation. This series of patterns was taken over a period of several hours, each pattern requiring approximately 20 minutes to record. If longer recording time were used, higher quality patterns could be obtained due to improvement in counting statistics. Molybdenum radiation was used, as