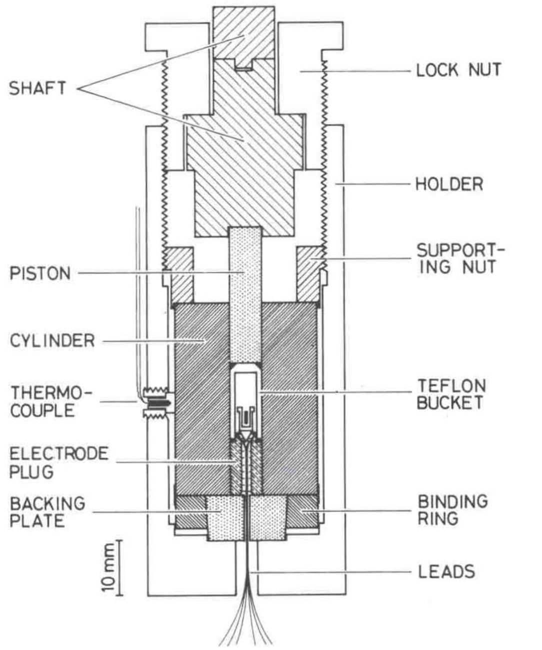

Fig. 1. Cross section of high pressure clamp cell, designed for pressures up to 30 kbar.

ments of both susceptibility and resistivity.

The pressure was generated with a simple clamp type piston–cylinder apparatus which was designed by some of the present authors [9]. Since the details will be separately described elsewhere, only the principles are given in the present paper. Fig. 1 shows a cross section of the pressure cell. The shaft, piston and cylinder were made of hardened alloy steel, WC and hardened Be–Cu, respectively. The cylinder was hydraulic autofrettage processed. As a result, the maximum working hydrostatic pressure was elevated to 30 kbar at room temperature. The pressure transmitting medium was a mixture of 1 : 1 n-pentane and isoamyl alcohol. The above-mentioned pressure generating assembly was inserted inside the holder, which also serves as a protector. At that time the settlement of the assembly was accomplished by the supporting nut and the backing plate with the binding ring. The sample cavity consists of a teflon bucket and Be–Cu electrode plug. The seal of the plug was provided by means of single cone sealing.

Except near 4.2 K, the manganin wire was used as a pressure gauge. The gauge was loosely wound on a bakelite bobbin glued on the cone. The calibration of

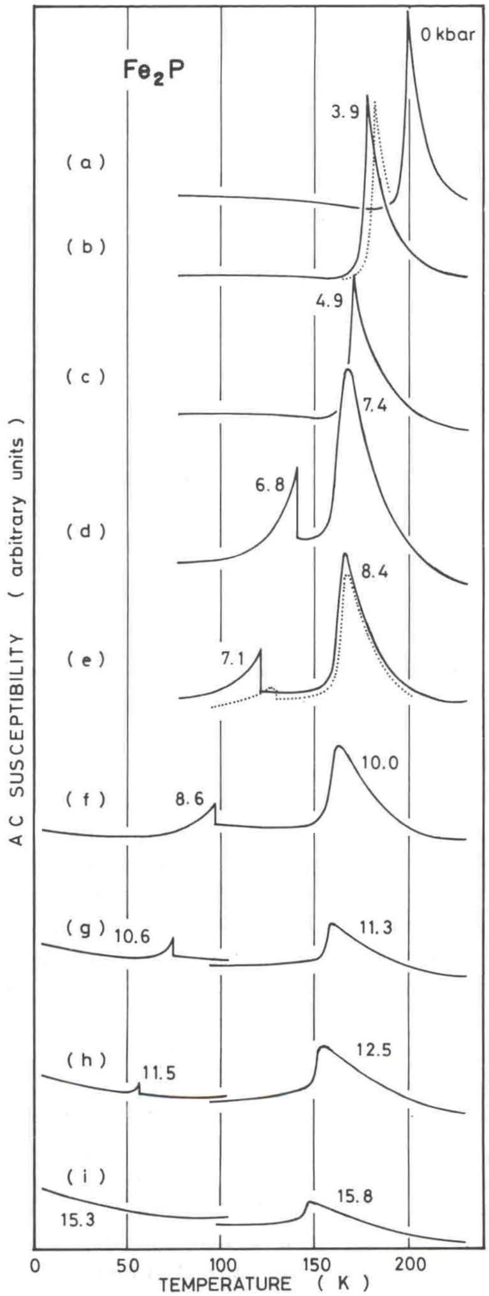

Fig. 2. AC susceptibility χ in arbitrary unit versus temperature under various pressures for Fe_2P. The details are described in the text.

the gauge was accomplished at room temperature by measuring the transition pressure of Bi I → II, 25.4 kbar. The pressures at lower temperatures were deter-

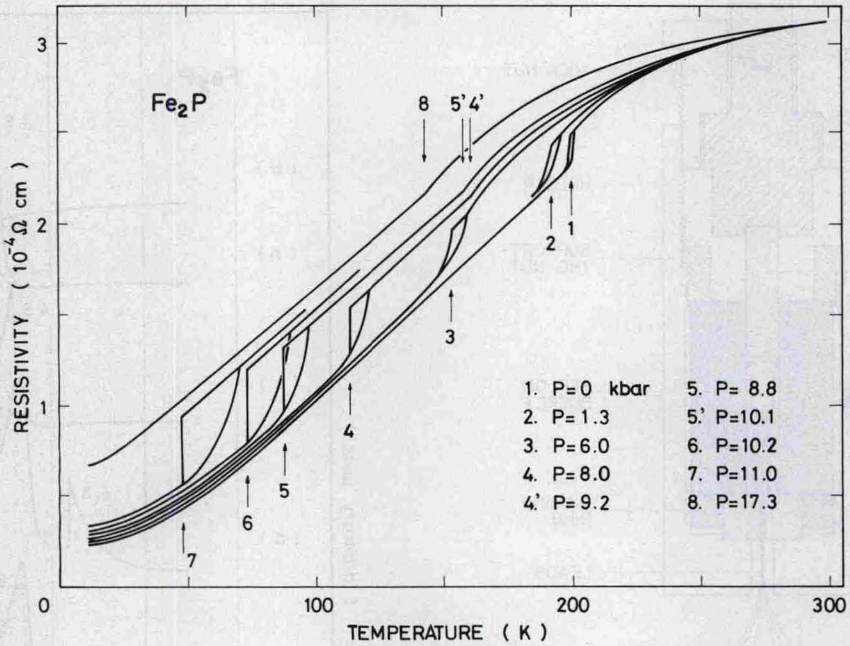

Fig. 3. Resistivity ρ versus temperature under various pressures for Fe_2P. The arrows with appended numbers in the figure indicate the locations of the transition temperatures. The pressures at respective transition temperatures are given in the right hand corner of the figure.

mined by taking into account the pressure drop during cooling, which was estimated from the observed results of the temperature dependence of the manganin resistance at different pressures. Practically, the pressure value initially determined at room temperature decreased almost linearly with temperature and became almost constant after freezing of the pressure medium. The pressure near 4.2 K was determined by measuring the shift of the superconducting transition temperature of Sn with pressure.

The ac susceptibility χ was measured by means of a Hartshorn bridge under the magnetic field applied along the *c*-axis. The amplitude and the frequency of the field were 0.1 Oe and 1 kHz, respectively. The electrical resistivity was measured along the *c*-axis with a standard four-probe method. Both measurements were made in a temperature range from 300 K down to 4.2 K. The temperature was lowered or raised at a rate of one degree per five to six minutes, and the experimental points were at intervals of one degree, so the results will not be plotted but drawn as a curve in the subsequent figures, figs. 2 and 3. The AuFe–Chromel thermocouple or Ge resistor was installed through a hole in the holder as indicated in fig. 1. For the measurements at lower temperatures, the whole assembly was transferred and placed in the thermal insultating chamber.

3. Results

3.1. Susceptibility measurement

Fig. 2 shows the variation of χ in arbitrary units in the temperature decreasing run under various pressures. In the figure, curve (a) indicates the result at atmospheric pressure, $p = 0$ kbar, and the pressure increases in a descending order from curve (b) to cruve (i). As is evident from the figure, there are well-defined peaks, indicating magnetic transitions, so that the magnetic transition temperature in the present work was defined as a peak temperature in the temperature decreasing run, as given by the solid curve. As described in the previous section, the pressure decreases during the temperature decreasing run, so that all the curves are not isobaric. Near the peaks,