although the constants a and b may change. The correction $T-T_c$ for all heat capacity measurements was therefore taken from the smoothed curve in figure 3. The temperatures T obtained in this way are estimated to be accurate to within ± 5 mdeg.

2·3. *Gas handling and operation*

A general scheme of the gas handling system is given in figure 4. Different methods were used for handling the two isotopes, because the rare isotope, ^{3}He, had to be recovered completely and was supplied at about atmospheric pressure.

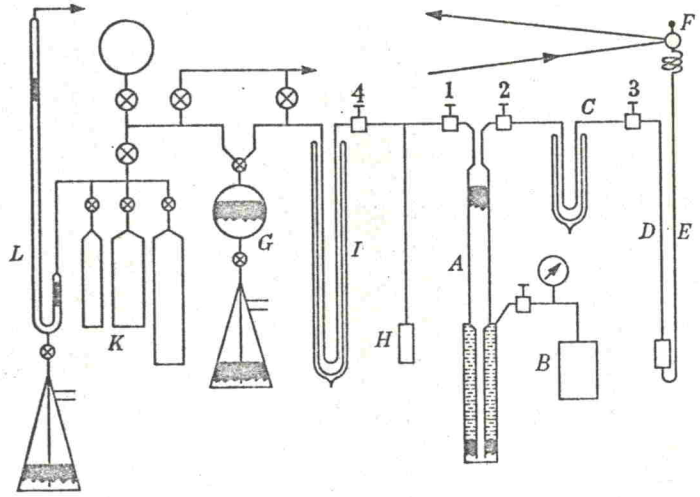

FIGURE 4. Schematic diagram of the gas handling assembly.

^{4}He was taken from a cylinder of commercial helium, purity 99·995 % with the remainder mainly N_2 and CO_2. It was passed at cylinder pressure (*ca.* 150 atm) through a silica-gel trap and a charcoal trap at liquid nitrogen temperature and then fed into the high pressure Toepler pump A. Valve 1 was then closed and the gas pressurized by means of the hydraulic pump B. The gas was fed into the calorimeter through the capillaries C and D of 0·1 mm bore with valves 2 and 3 open. The capillary C passed through liquid nitrogen for about 50 cm. The calorimeter was cooled to 20 °K with valve 3 closed. At 20 °K additional helium was fed into the calorimeter to roughly the required density. The liquid helium stage of the cryostat was then cooled to 4 °K and the calorimeter cooled to below the freezing point with valves 2 and 3 open. No particular care was taken to freeze the sample slowly. Valve 3 was then closed and the measurements started. Valve 3 is a miniaturized high-pressure valve, and care had been taken to avoid dead space. Its dead space on the calorimeter side, when closed, is about 0·0018 cm^3. Pressure transmission to the calorimeter during the filling operation could be easily monitored on the Bourdon gauge F. This gauge was made from copper-beryllium tubing of 0·4 mm bore and had a volume of 0·058 cm^3. Observation of this gauge showed too that the high pressure capillaries D and E stayed blocked while working in the melting and the fluid range.

^{3}He was supplied through the Monsanto Company and the supplied analysis shows no detectable ^{4}He impurity. The gas was pressurized to about 1·5 atm in the low pressure Toepler pump G and condensed under this pressure at about 1·5 °K in the pressure