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The lowest temperatures are obtained by the method of adiabatic demagnetisation. When a paramagnetic substance is magnetised, its molecules are set in the direction of the magnetising field. The necessary work done in this process is added to the internal energy of the substance which therefore suffers a rise in temperature. If the substance is allowed to cool and then demagnetised under adiabatic conditions, the molecules return to their original random distribution and there is a corresponding fall in temperature. This effect is very much pronounced at very low temperatures.

Giauque and Mc Dougall used gadolinium sulphate (a paramagnetic salt) and a magnetic field of 8000 Gauss and obtained a temperature of 0.25 K. De Haas and Wiersma using a mixture of chrome - potassium alum and aluminium - potassium alum went down to 0.0044 K. In 1956, Klerk, Steenland and Gorter used powdered mixed crystals of chromium - alum and aluminium - alum and attained a temp. of 0.0014 K.

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