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practical realisation of absolute scale.

The Kelvin's absolute scale cannot be directly realised in practice. However, it is exactly identical to an ideal gas scale. Hence the temperatures measured by a constant volume thermometer filled with an ideal gas would exactly be the same as the temperature measured on an absolute scale. But practice, no gas is ideal, Hence we cannot have an ideal gas thermometer. constant-volume H_2-gas thermometer is the closest approach to an ideal gas thermometer. Any reading taken on this thermometer can be corrected to obtain the corresponding reading on the ideal gas thermometer. Thus Kelvin's absolute scale which coincides with the ideal gas scale, is realised in practic.

No negative temperature on the absolute scale:— The efficiency of a Carnot's engine is

$$\eta = 1 - \frac{T_2}{T_1}$$

where T_1 is the temperature of the source and T_2 that of sink.

$$\therefore \frac{T_2}{T_1} = \frac{\theta_2}{\theta_1}$$

$$\therefore \eta = 1 - \frac{\theta_2}{\theta_1}$$

For $\eta = 100\%$, θ must be zero. This means, if a sink at absolute zero were available, all the heat in from the source would have been converted into work.

$$\therefore \eta = 1.$$

Hence, a negative temperature on the absolute scale would mean a temperature of the sink at which the efficiency of the engine is greater than unity. This will violate the Second law of thermodynamics. Hence a negative temperature on the absolute scale is impossible.