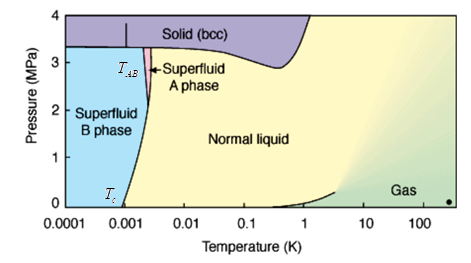
**Thermal Equilibrium Properties**

**Phase Diagram**

3He is a fermionic liquid which also displays unique properties. It develops a Fermi distribution at low temperature, and the particles have a superfluid transition which is similar to the superconducting transition in a metal. Of course, now it is occurring in a liquid of electrically neutral atoms, so there is no Meissner effect, but there is pairing. However that also has a unique character, since the atoms avoid the usual singlet pairing common to metals and instead form the triplet state. The triplet pairing, in turn, leads to many new phenomena and a richer phase diagram. This phase diagram is shown below.



There are two superfluid phases – marked A and B. The border between A and B is delineated by TAB and it is a first order transition between the two. The location of TAB is strongly affected by the presence of weak magnetic fields. Both A and B are spin-triplet pairing phases. Tc delineates the superfluid phase from the normal liquid phase and is a second order phase transition.