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Superconductors – Abstract

Superconductivity is the phenomenon of zero resistance. Certain elements and ceramic compounds when cooled below a certain critical temperature will lose electrical resistance. Type one superconductors are single elements and have very low critical temperatures. These superconductors are well understood through BCS theory. Type two superconductors are layered compounds that have high critical temperatures (185 Kelvin the highest recorded thus far). When materials make the transition to a superconducting state, magnetic fields are repelled from the interior of the superconductor, known as the Meissner effect. Superconductors have many modern uses such as: magnetic levitation, magnetic resonance imaging and in accelerator magnets at CERN. There is still a lot to be discovered with type two superconductors, and upcoming years should see the development of superconductors with even higher critical temperatures.