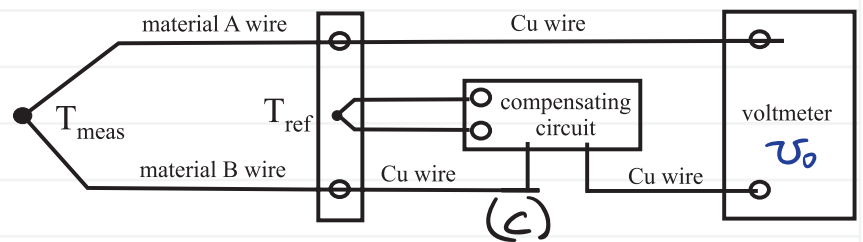
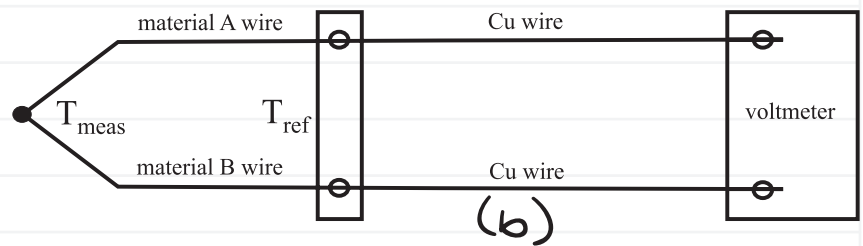
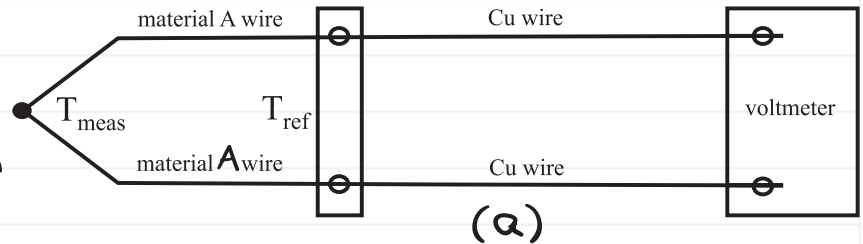


# Thermocouples

The **thermoelectric effect** (or **Seebeck effect**) is the phenomenon that when a thermal gradient is applied to a conductor, a voltage is induced across it. If one connects two wires of the same material (Figure (a)), the temp across the wires is in the "opposite" direction, cancelling any measurable effect.



$T_{ref}$  must be known in order to determine  $T_{meas}$ . Figure (c) shows the modern approach, with a compensating circuit that measures  $T_{ref}$  electronically with a thermistor, amplifies the signal, and linearizes it. (A classical method was to place  $T_{ref}$  into an ice bath @  $0^\circ C$ , but this is inconvenient). For modern TCs,

