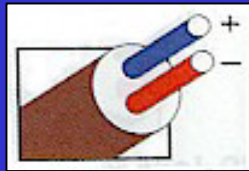


Selecting among thermocouple wire types



Bruce Bugbee
Utah State University

Thermocouple Type

Wire Color

T

Blue / Red



K

Yellow / Red



E

Purple / Red



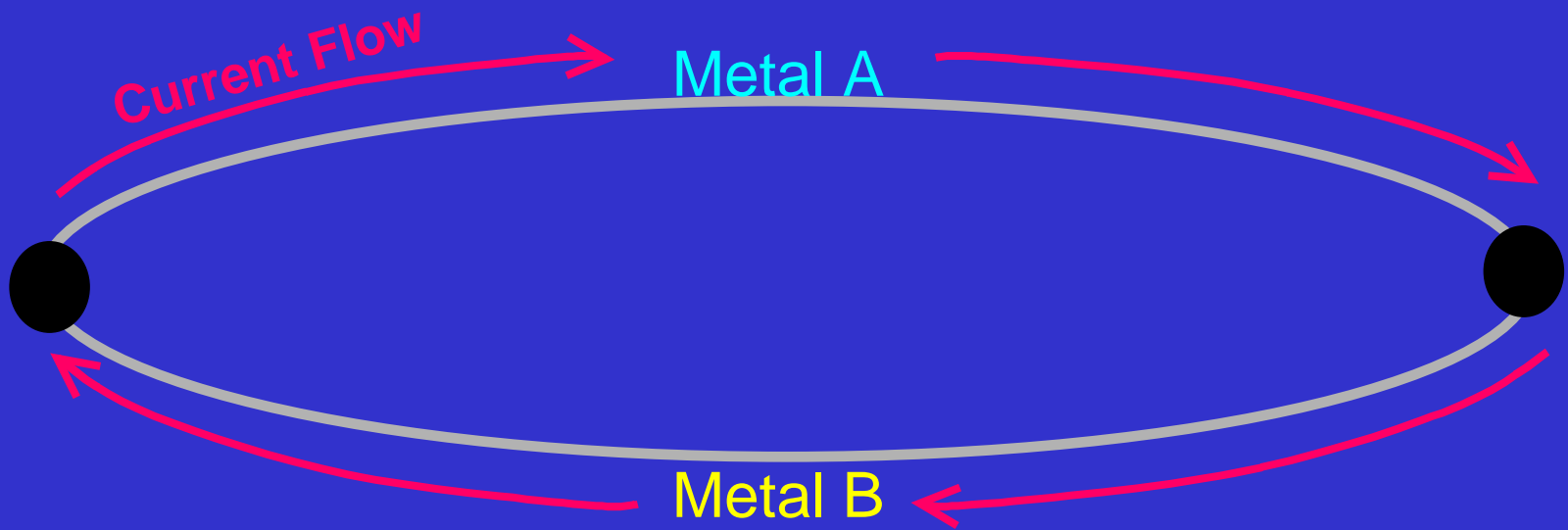
Red is always negative in thermocouples

Wire Type	Thermal Conductivity $W\ cm^{-1}\ ^{\circ}C^{-1}$	Relative Heat Transfer
Chromel	0.20	5.1
Constantan	0.22	5.6
Alumel	0.16	4.1
Copper	3.9	100

Copper wire is an excellent conductor of heat so it is a poor choice for thermocouple wire

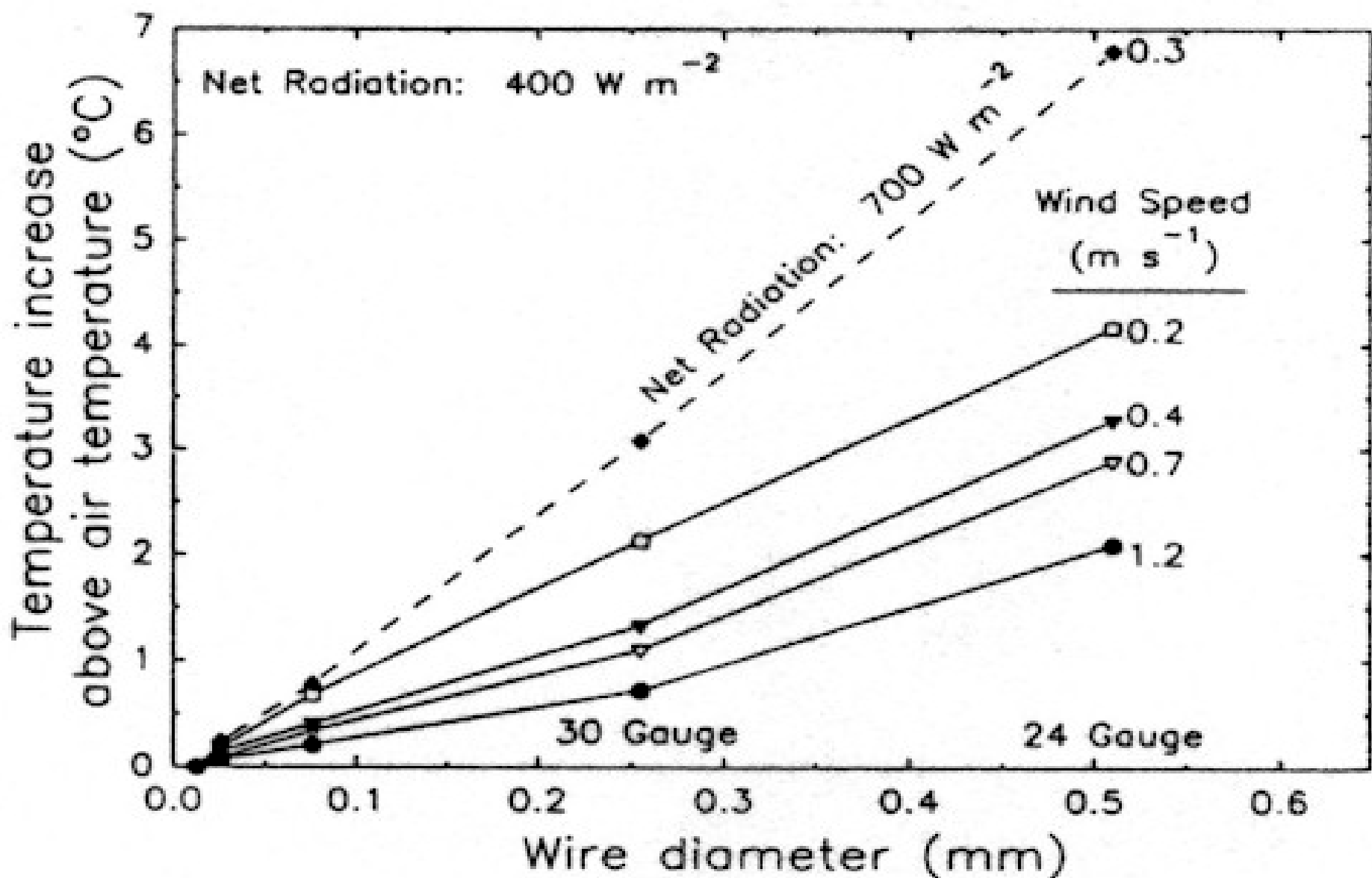
Thermocouple Type	Wire Type	Thermal EMF μV per $^{\circ}\text{C}$
T	Copper/Constantan	40
K	Chromel/Alumel	40
E	Chromel/Constantan	60

Type E wire has 1.5 times more output than other thermocouple types



The Seebeck Effect

**Current flows when 2 dissimilar metals are joined
*and the ends are at different temperatures.***



The effect of wind speed, wire diameter, and radiation on temperature rise above air temperature.