

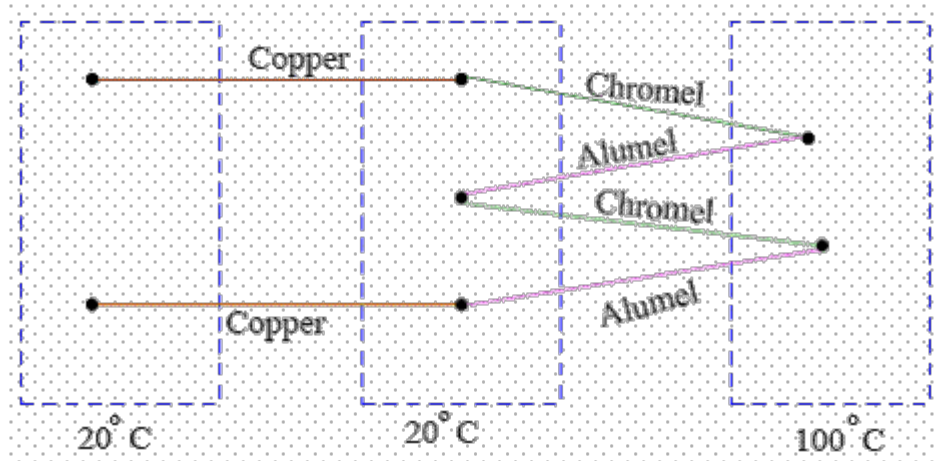
### Exercise 1

Consider an Iron - copper thermocouple. Suggest a method of measuring the temperature of a junction using a voltmeter with copper lead wires.

### Exercise 2

Consider an Iron - copper thermocouple. Suggest a method of measuring the temperature of a junction using a voltmeter with copper lead wires.

For the circuit shown below, calculate the voltage measured at the copper terminals under isothermal conditions. Use the table for thermo-emf. (Hint. you do not need thermo emf data at  $20^{\circ}\text{C}$ .) (4.1 mV)



### Exercise 3

From the table of Seebeck coefficients, calculate the Peltier coefficient of an Iron-copper thermocouple at  $0^{\circ}\text{C}$ . (Ans. 3.4 V)

### Exercise 4

A chromel-constantan thermocouple with the cold junction at  $0^{\circ}\text{C}$  has a linear variation of the open circuit voltage with the temperature of the hot junction. Using the thermo-emf values at  $100^{\circ}\text{C}$  from the table, calculate (i) the thermo-emf when the hot junction is maintained at  $150^{\circ}\text{C}$ , (ii) Peltier coefficient at  $150^{\circ}\text{C}$  and (iii) the difference between Thomson emf at this temperature. [Hint : Emf is zero when the hot junction is at  $0^{\circ}\text{C}$ ]

(Ans. (i) 9.5 mV (ii) 26.7 mV (iii) 0)