

TABLE 8-5  
Polynomial coefficients for Eq. (8-12) for several standard thermocouple combinations

| Type E                                   | Type J                               | Type K  | Type R                                     | Type S                                     | Type T                                  |
|--|--------------------------------------|---|--|--|---|
| Chromel(+) versus constantan(-)          | Iron(+) versus constantan(-)         | Chromel(+) versus nickel-5%(-) (aluminum silicon) | Platinum-13% rhodium(+) versus platinum(-) | Platinum-10% rhodium(+) versus platinum(-) | Copper(+) versus constantan(-)          |
| -100°C to 1000°C*<br>±0.5°C<br>9th order | 0°C to 760°C*<br>±0.1°C<br>5th order | 0°C to 1370°C*<br>±0.7°C<br>8th order             | 0°C to 1000°C*<br>±0.5°C<br>8th order      | 0°C to 1750°C*<br>±1°C<br>9th order        | -160°C to 400°C*<br>±0.5°C<br>7th order |
| $a_0$ 0.104967248                        | -0.048868252                         | 0.226584602                                       | 0.263632917                                | 0.927763167                                | 0.100860910                             |
| $a_1$ 17189.45282                        | 19873.14503                          | 24152.10900                                       | 179075.491                                 | 169526.5150                                | 25727.94369                             |
| $a_2$ -282639.0850                       | -218614.5353                         | 67233.4248  | -48840341.37                               | -31568363.94                               | -767345.8295                            |
| $a_3$ 12695339.5                         | 11569199.78                          | 2210340.682                                       | 1.90002E + 10                              | 8990730663                                 | 78025595.81                             |
| $a_4$ -448703084.6                       | -264917531.4                         | -860963914.9                                      | -4.82704E + 12                             | -1.63565E + 12                             | -9247486589                             |
| $a_5$ 1.10866E + 10                      | 2018441314                           | 4.83506E + 10                                     | 7.62091E + 14                              | 1.88027E + 14                              | 6.97688E + 11                           |
| $a_6$ -1.76807E + 11                     |                                      | -1.18452E + 12                                    | -7.20026E + 16                             | -1.37241E + 1                              | -2.66192E + 13                          |
| $a_7$ 1.71842E + 12                      |                                      | 1.38690E + 13                                     | 3.71496E + 18                              | 6.17501E + 17                              | 3.94078E + 14                           |
| $a_8$ -9.19278E + 12                     |                                      | -6.33708E + 13                                    | -8.03104E + 19                             | -1.56105E + 19                             |   |
| $a_9$ 2.06132E + 13                      |                                      |   |  | 1.69535E + 20                              |   |

$$T = a_0 + a_1 V + a_2 V^2 + \dots + a_9 V^9$$