

DNA melting temperature

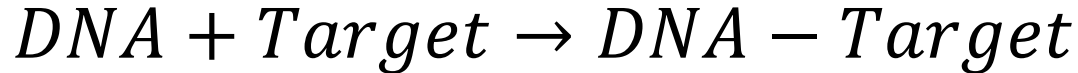
A 25-mer primer of DNA has hybridization enthalpy and entropy given below. Calculate the melting temperature of the primer.

$$\Delta_{hyb}H^{\circ} = -92 \text{ kJ/mol}$$

$$\Delta_{hyb}S^{\circ} = -276 \text{ J/molK}$$

DNA melting temperature

The melting temperature at which hybridization



is no longer spontaneous occurs when

$$\Delta_{hyb}G^{\circ} = 0.$$

This temperature is:

$$T = \frac{\Delta_{hyb}H^{\circ}}{\Delta_{hyb}S^{\circ}}$$

$$T = \frac{-92,000 \text{ J/mol}}{-276 \text{ J/molK}} = 333 \text{ K}$$