

102. Using Eq. 19-40 with $T = 323$ K and $T_{\text{env}} = 293$ K, we find

$$P_{\text{net}} = \sigma \varepsilon A (T_{\text{env}}^4 - T^4) = -3.8 \times 10^{-7} \text{ W}$$

where we have used the fact that the surface area of the cube is $A = 6A_{\text{face}} = 6(2.0 \times 10^{-5} \text{ m})^2 = 2.4 \times 10^{-9} \text{ m}^2$.