$$
\begin{gathered}
\frac{C_{x}-C_{0}}{C_{s}-C_{0}}=1-\operatorname{erf}\left(\frac{x}{2 \sqrt{D t}}\right) \\
\frac{4.0 \times 10^{23} \mathrm{~m}^{-3}-0}{1.0 \times 10^{25} \mathrm{~m}^{-3}-0}=1-\operatorname{erf}\left(\frac{x}{2 \sqrt{D t}}\right)
\end{gathered}
$$

which reduces to

$$
0.9600=\operatorname{erf}\left(\frac{x}{2 \sqrt{D t}}\right)
$$

In order to solve this expression for a value $\frac{x}{2 \sqrt{D t}}$ of it is necessary to interpolate using data in Table 5.1. Thus

| $\underline{Z}$ | $\underline{\operatorname{erf}(z)}$ |
| :---: | :---: |
| 1.4 | 0.9523 |
| $Z$ | 0.9600 |
| 1.5 | 0.9661 |

$$
\frac{z-1.4}{1.5-1.4}=\frac{0.9600-0.9523}{0.9661-0.9523}
$$

From which, $z=1.4558$; which is to say

$$
1.4558=\frac{x}{2 \sqrt{D t}}
$$

Inasmuch as there are $3600 \mathrm{~s} / \mathrm{h}(=t)$ and $x=0.2 \mu \mathrm{~m}\left(=2 \times 10^{-7} \mathrm{~m}\right)$ the above equation becomes

$$
1.4558=\frac{2 \times 10^{-7} \mathrm{~m}}{2 \sqrt{(D)(3600 \mathrm{~s})}}
$$

which, when solving for the value of $D$, leads to

$$
D=\frac{1}{3600 \mathrm{~s}}\left[\frac{2 \times 10^{-7} \mathrm{~m}}{(2)(1.4558)}\right]^{2}=1.31 \times 10^{-18} \mathrm{~m}^{2} / \mathrm{s}
$$

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