22.27. **Model:** The gas increases the number of wavelengths in one arm of the interferometer. Each additional wavelength causes one bright-dark-bright fringe shift.
Solve: From Equation 22.36, the number of fringe shifts is

$$\Delta m = m_2 - m_1 = (n-1)\frac{2d}{\lambda_{\text{vac}}} = (1.00028-1)\frac{(2)(2.00\times10^{-2}\ \text{m})}{600\times10^{-9}\ \text{m}} = 19$$