Chemistry 2720 Fall 2003 Quiz 7

Name: _____

At 10 K, the molecules in a gas have an average kinetic energy of 2×10^{-22} J. Would quantum mechanical effects be important to understand the motion of helium atoms at this temperature? Base your answer on the results of simple calculations.

Data: $m(^4\mathrm{He}) = 4.002\,603\,\mathrm{amu}$, $1\,\mathrm{amu} = 1.660\,539 \times 10^{-27}\,\mathrm{kg}$, $h = 6.626\,069 \times 10^{-34}\,\mathrm{J/Hz}$