In Class 4: The Electromagnetic Spectrum, Units, Scientific Notation

1. a. Put the following types of electromagnetic radiation in order from the highest frequency to the lowest (4 pt):

Yellow light from a sodium lamp Gamma rays coming from deep outer space Radiowaves from a nuclear magnetic resonance (NMR) spectrometer operating at 270 MHz (that is ours!) The infrared (IR) radiation associated with a C=O bond stretch

b. Calculate the wavelength of the photons from the NMR in nm.

c. Calculate the energy of one of these photons.

2. The energy required to break a C-C bond in a molecule is 348 kJ/mol. What wavelength of light (in nm) would be required to carry out this chemical process using only light as the energy source? (8 pt)