

**NORTH CAROLINA STATE UNIVERSITY**

Department of Chemistry

Name \_\_\_\_\_

CH 795T

Molecular Spectroscopy

Problem Set #5

Oct. 24, 2007

Due Date: Nov. 2, 2007

1. Calculate the polarizability contribution to the hydrogen atom from the  $n = 2, 3$  and  $4$  levels.
  - A.  $n = 2$
  - B.  $n = 3$
  - C.  $n = 4$

2. Compare the magnitude of the contributions. What can you say about the contribution of the remaining levels?

3. What is the approximate polarizability of the hydrogen atom? Compare this value to the volume polarizability you calculate assuming that the radius of the hydrogen atom is  $\sqrt{3/2}$  times the Bohr radius.