

AOSC 433/633 & CHEM 433/633 Atmospheric Chemistry and Climate

Admission Ticket, Lecture 07: 10 points

Due: Thursday, 14 February 2013 (at start of class)

Your name: _____

a) (5 points) Greenhouse gases absorb infrared (IR) radiation (or thermal radiation) and re-radiate this energy in all directions, including to the surface and to space. Ultraviolet (UV) radiation (sunlight) is also absorbed by atmospheric gases. However, a different physical consequence results when UV radiation is absorbed compared to what happens when IR radiation is captured by an atmospheric gas.

What generally happens to molecules when UV radiation is absorbed?

Why does this happen for UV radiation and not IR radiation?

b) (5 points) Some gases, such as N_2 and O_2 , are not considered greenhouse gases because they do not interact with the IR radiation field. Also, some vibrational modes of CO_2 do not interact with the IR field. Briefly describe a physical characteristic of CO_2 leads to the interaction with the IR field?