ATOC 3500/CHEM 3151

Spring 2018

Video Assignment 1

Answer the following questions based on the video lecture “The Canary in the Coal Mine: Why the Stratosphere is Still Relevant.”

<https://www.youtube.com/watch?v=QfcoEl3qz3c>

1. In what year did Martinus Van Marum detect that an electrical discharge in air produced an odor that was later identified as the compound ozone? \_\_\_\_\_\_\_\_\_
2. Do researchers, some based at CU Boulder, think that it is a good idea or a bad idea to breathe ozone produced by air purifiers?
3. What light source did Dobson look at with his spectrometer to determine how much ozone was in the atmosphere?
4. In what year did Joe Farman take a spectrometer to Antarctic to measure ozone?
5. Where on Earth, the tropics or the poles, does air rise? Where on Earth, the tropics or the poles, does air sink?
6. What splits the oxygen (O2) molecule, thus leading to formation of ozone?
7. In Cairo, Egypt, how many “watts per square meter” come directly from the Sun?
8. In Cairo, Egypt, how many “watts per square meter” come from molecules called “greenhouse gases.”
9. On average, what fraction of the total energy hitting Earth’s surface comes from the atmosphere?
10. What happened to the temperature in the stratosphere, did it get warmer or cooler, as abundances of greenhouse gases increased in the atmosphere?
11. What volcano erupted in 1991, causing a 0.2 to 0.3 oC drop in surface temperatures for several years?
12. What chemical emitted by volcanoes produces particles in the stratosphere that reflect light back to space?
13. What size particles are better at scattering light back to space, small or large?
14. What compound emitted by the Space Shuttle ends up causing ozone depletion?
15. List three considerations for solar radiation management experiments in the stratosphere.