EHST 1301 Chemical and Physical Properties – Due:

You will demonstrate your ability to locate and interpret chemical and physical properties of hazardous materials.

What you should do:
1. Read pages assigned for Chemical and Physical Properties listed at the course (EHST 1301) web page. Review your lecture notes and the document Chemical and Physical Properties Definitions - located at the course web page.
2. Use the following scenario to challenge your knowledge of chemical and physical properties, your ability to locate them, and put them to use in real world situations.
3. Locate the chemical of interest in the NIOSH Pocket Guide to Chemical Hazards located at http://www.cdc.gov/niosh/npg/npg.html. Use the alphabetized “Index of Chemical Names” to reveal its specific chemical and physical properties. IMPORTANT: See the Guide’s “Introduction” for help interpreting any abbreviations you encounter.
4. Type your answers to the scenario questions and turn in on the due date.

To get all 15 points on this assignment:
1. Prepare a correct answer for each question about the scenario.
2. Support your answers with scientific evidence: the specific chemical or physical properties.
3. Neatly prepare your answers and format them appropriately.
4. Turn in your TYPEWRITTEN ANSWERS on paper on time. No e-mail please.

As with all assignments and projects, please call, write or see me with any questions you have. Do not let uncertainty get you frustrated.

Scenario:
On a cold winter day (20°F) in northern Ohio, a train derails next to a creek. The sun is shining and winds are calm. There is no snow on the ground. A tank car containing the substance, octane, is damaged and begins leaking. The tanker is situated on an embankment about 30 feet upslope from a creek. The creek is approximately 15’ wide and two feet deep. It is not ice covered at this time. Almost instantly, curious people witnessing the scene from a nearby road and others seeking to help approach the scene and observe the leaking tanker.

1. Is the octane leaking from the tank a solid, liquid, or a vapor/gas at this temperature? (assume the tank temperature and the air temperature are about the same)
2. Is the leaking octane likely to reach the creek below? If not, why not?
3. If the octane were to reach the creek, will it float upon the water, sink to the bottom of the creek, fill the creek channel with vapors, or go into solution in the water?
4. Uh oh! A bystander is about to light up a cigarette. Will the octane ignite if the bystander attempts to light a cigarette within a few feet of the leak? (Use data to justify your answer, I already know that smoking is prohibited at all accident scenes.)
5. If octane has a vapor density of 3.9, are the bystanders in immediate danger from significant airborne exposure? What about someone standing next to the creek?
6. Now, change the day to an 80°F summer day. Do your answers to 1 and 4 change? If so, explain.