No Chem News articles due until books are returned (by Monday??)

Exam on Ch. 9 and concentration lab Friday. Option to start at 8:00
(recommended).

Review exercise during lab session
- 9:30 - 11:00 and 12:00 - 1:30
- Attendance expected as regular lab

Chem news:
- Zach DeJonge

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1. Over the past two years, there has been a very large push for
congress to find alternative fuel sources such as ethanol, as oil
prices have surged.
2. President Bush in his last State of the Union, issued $1b
toward research leading to alternative fuel sources. After
many states complained that there was a lack of funding
provided to continue the research.
3. With this bill passed/approved, there is now a growing debate
between ethanol rich states and non ethanol producing states.
This battle would be between states such as Michigan,
Minnesota, Iowa, Nebraska vs. states such as Florida, New
York etc.
4. The most common source of ethanol is found in corn stalks.
The composition of the new fuel would be a blend of 85% 
ethanol and 15% gasoline. This new fuel would go by E85.

5. This new fuel is already in production and available in some
states, the only problem is that many gas stations are not yet
equipped to support this type of fuel, and almost anything found
on the road today is not updated enough to burn this compound
(E85).
6. GM has made all of there new ‘06 equipped and ready to burn this
fuel. By switching to E85, people would save hundreds even
thousands of dollars.
7. Hydrogen and fuel cell research is under way in varied spots
across the country, as are wind and solar projects. This is all in
an attempt to divorce the US from the ‘unregulated’ oil markets
of the mid east. There has also been increasing debate over the
drilling in Alaska. Some say the US has a supply close to the
that of the mid east, under Alaska.

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In E85 the ethanol is considered

1. The solvent
2. The solute
3. A solution

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<table>
<thead>
<tr>
<th>starting concentration</th>
<th>starting volume</th>
<th>final volume</th>
<th>final concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 0.2 g in 10 mL</td>
<td>2.0% ppm</td>
<td>20,000 ppm</td>
<td>3.31 x 10^{-5} M</td>
</tr>
<tr>
<td>B 5 mL A to 1000 mL</td>
<td>0.01% ppm</td>
<td>100 ppm</td>
<td>1.66 x 10^{-4} M</td>
</tr>
<tr>
<td>C 2 mL B to 300 mL</td>
<td>0.000067% ppm</td>
<td>0.67 ppm</td>
<td>1.11 x 10^{-4} M</td>
</tr>
</tbody>
</table>

- Which has more dye, 2 mL of B or 250 mL of C?
- (Solution volume) x (concentration) = amount solute

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1 L of water or dilute solution has a mass of

1. 1 gram
2. 100 grams
3. 1000 grams
4. 0.1 grams
1 mg has a mass of

3% 1. $10^{-3}$ grams
3% 2. $10^{-2}$ grams
0% 3. 100 grams
13% 4. 1000 grams

ppm can be represented as

9% 1. grams/L
34% 2. grams/mL
9% 3. mg/mL
9% 4. mg/L

To do this directly in terms of mass

- Recognize the ppm can be written as the ratio of mg/L.
- Thus, 100 ppm can be written as 100 mg/L and 0.67 ppm can be written as 0.67 mg/L.
- So want volume in L
  - For B, 2 mL is 0.002 L
  - For C, 250 mL is 0.250 L
- For B, 0.002 L x 100 mg/L = 0.2 mg
- For C, 0.250 L x 0.67 mg/L = 0.168 mg

Can be answered in moles as well

- Molarity is moles/L, so want volume in L.
  - For B, 2 mL x 1 L/1000 mL = 0.002 L
  - For C, 250 mL x 1 L/1000 mL = 0.250 L
- For B, 0.002 L x 1.66x10^{-4} M = 3.32x10^{-7} mole
- For C, 0.250 L x 1.11x10^{-6} M = 2.77x10^{-7} mole

Working with mass, moles and balanced equations

1. Balanced Equation
2. Molecular weights of two related compounds
3. Convert grams first compound to moles
4. Convert moles first compound to moles second compound
5. Convert moles second compound to grams second compound

- Ch. 9 exam on Friday, start at 8:00 - bring calculator
- Mole concept, convert mass to number of atoms - Avogadros
- Simple balanced equation - given grams of a reactant calculate grams of product formed (or any other combination from the balanced equation).
- Concentration: %, ppm, molarity
- Dilution
- Complete worksheet in lab tomorrow