Announcements – 9/20/00

- Exam Tonight!

  -meet in Lab Room (A141 Cook)

- No Quiz Friday
- Monday's Quiz: not graded
- Demo on Friday????

1

Molarity

- Typical concentrations:

  -usually won't see much below about 10^{-2} M

  What is the **molarity** of conc. H_2SO_4?

  on the bottle: 94.0 % H_2SO_4 - mass %
  1.831 g/mL - density

  A conversion: *mass % ® molarity*

$$\frac{94.0\text{ g } H_2SO_4}{100.0\text{ g sol'n}} \times \frac{1\text{ mol } H_2SO_4}{98.08\text{ g } H_2SO_4} \times \frac{1.831\text{ g sol'n}}{\text{mL sol'n}} \times \frac{1000\text{ mL sol'n}}{1\text{ L sol'n}} =$$

$$= 17.54833 \text{ mol } H_2SO_4/\text{L sol'n}$$

$$= \mathbf{17.5\ M\ H_2SO_4}$$

2

Molarity of Water

- In aqueous solutions, the highest concentration is the molarity of pure water:

  How many mol H_2O per Liter?

$$1.000\ L\ H_2O \times \frac{1000\ mL}{1\ L} \times \frac{1.00\ g\ H_2O}{1\ mL} \times \frac{1\ mol\ H_2O}{18.0148\ g\ H_2O} =$$

$$= 55.50991\ mol\ H_2O$$

So: $\frac{55.5\ mol\ H_2O}{1.000\ L\ H_2O} = \mathbf{55.5\ M\ H_2O}$

3

Dilutions

- *# mol solute remains unchanged during dilution:*

 # mol solute (initial) = # mol solute (final)

concentrated diluted

$$\mathbf{M_1V_1 = M_2V_2}$$

Example: How many mL conc. H_2SO_4 must be diluted to make 500. mL of 2.0 M H_2SO_4?

$$17.54844\ M\ (V_1) = 2.0\ M\ (500.\ mL)$$

$$V_1 = 56.985\ mL$$

-Add 57. mL conc. H_2SO_4 to water and bring up to 500. mL

4