

# Agenda

## 1. Word of the day

**totem** \TOH-tum\ (noun)

1 : an object (as an animal or plant) serving as the emblem of a family or clan; also : something usually carved or painted to represent such an object

\*2 : something that serves as an emblem or revered symbol

Example sentence:

"Libraries are icons of our cultural intellect, totems to the totality of knowledge." (Mark Y. Herring, *The Herald* [Rock Hill, S.C.], July 7, 2001)

Did you know?

"Totem" comes to us from Ojibwa, an Algonquian language spoken by an American Indian people from the regions around Lake Superior. The most basic form of the word in Ojibwa is believed to be "ote," but 18th-century English speakers encountered it as "ototeman" ("his totem"), which became our "totem." In its most specific sense, "totem" refers to an emblematic depiction of an animal or plant that gives a family or clan its name and that often serves as a reminder of its ancestry. The term is also used broadly for any thing or person having particular emblematic or symbolic importance. The related adjective "totemic" describes something that serves as a totem, that depicts totems ("totemic basketry," for example), or that has the nature of a totem.

**grandiloquence** \gran-DIH-luh-kwunss\ *noun*

: a lofty, extravagantly colorful, pompous, or bombastic style, manner, or quality especially in language

**macadam** \muh-KAD-um\ *noun*

: a roadway or pavement of small closely packed broken stone

<<http://www.merriam-webster.com/sound/m/macada01.wav>>

**Example sentence:**

We left the old city with much regret, passing from its quaint cobblestones to lumpy macadam, leaving our vacation behind and returning reluctantly to the workaday world.

### **Did you know?**

In 1783, inventor John Loudon McAdam returned to his native Scotland after amassing a fortune in New York. He was promptly made road trustee for his district and quickly set his inventiveness to remedying the terrible condition of local roads. After numerous experiments, he created a new inexpensive but durable road surfacing material made of bits of stone that became compressed into a solid mass as traffic passed over them. His invention revolutionized road construction and transportation, and engineers and the public alike honored him by using his name (respelled "macadam") as a generic term for the material or pavement made from it. He is further immortalized in the verb "macadamize," which names the process of installing macadam on a road.

### **bauxite.**

Main Entry: **baux·ite** [javascript:popWin\('/cgi-bin/audio.pl?bauxit01.wav=bauxite'\)](javascript:popWin('/cgi-bin/audio.pl?bauxit01.wav=bauxite'))

Pronunciation: 'bɒk-"sɪt, 'bæk-

Function: *noun*

Etymology: French *bauxite*, from Les *Baux*, near Arles, France  
: an impure mixture of earthy hydrous aluminum oxides and hydroxides that is the principal source of aluminum

### • **Latin/French expression of the day**

a priori

a posteriori

**non sequitur**

haute couture

“mayday” = m’aidire = “help me”

Instructor Sloth

HW – to be emailed this Wed.

Quiz:

- 1) short answer question on acids/bases and/or pH
- 2) calculation of pH and/or pOH for a strong acid and/or strong base.

**How large is a molecule?**

Atoms: 30 -300 pm ( $10^{-12}$  m)

## **Estimating the size of a molecule**

In water conservation chemists spread a thin film of certain materials over the surface of water to cut down on the rate of evaporation of water in the reservoirs. This technique was pioneered by Benjamin Franklin three centuries ago. Franklin found that 0.10 mL of oil could spread over the surface of water of about 36 m<sup>2</sup> (square meters) in area. Assuming that the oil has formed a monolayer (i.e. a layer that is only one molecule thick), estimate the length of each oil molecule in nanometers. (1 nm =  $1 \times 10^{-9}$  m) Find the answer in nanometers.

## **Chapter 10**

**Arrhenius Definition of an acid and base:**

An Acid releases an  $H^+$  in water.

A Base releases a hydroxide in water ( $OH^-$ ).

NaOH

$H^+ + OH^- \rightarrow H_2O$ . This is called a neutralization reaction.

**Bronsted-Lowry** definition:

An acid donates a proton and a base accepts a proton.

Ammonia in water:



In this case,  $NH_4^+$  is acting as an acid. We call it the *conjugate acid of  $NH_3$* .

A **strong acid** dissociates, i.e., breaks apart, 100% in water.

HCl = hydrochloric acid

HNO<sub>3</sub> = nitric acid

H<sub>2</sub>SO<sub>4</sub> = sulfuric acid

A strong base dissociates 100%



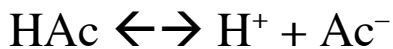


(potassium hydroxide)

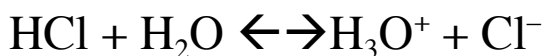
Weak acid does not dissociate completely.

e.g.

acetic acid only dissociates about 5% in water. We will represent it as HAc.

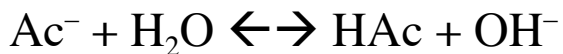


Water: can be act as both an acid and a base



### **Hydrolysis reaction**

The conjugate base of a weak acid can react with water:



Determining pH:

$$\text{pH} = -\log [\text{H}^+]$$

$$\text{pOH} = -\log [\text{OH}^-]$$

$$\text{pH} + \text{pOH} = 14$$

