

Thursday, May 30/13
Science 122

Announcements

**** Need an activity re a course topic before the end of May.**

Quiz - Electrochemistry - IS Monday (Lucas and Mike C)

1. Exam Review - Nuclear and Quantum Physics
2. Activities:
Lucas - Linear Thermal Expansion
Mike N - Bernoulli - Flowing Fluids
3. Worksheets (3) - Redox Tables, Predicting Entities and Predicting Redox Reactions
4. Redox Reactions and Titrations - 3 Lab Exercises
5. Using Redox Numbers to Balance Redox Reactions

HW - Finish the example started in class.



Activity

Connection to Course Material -> 5

Pre-planning -> 5

Prepared on the Day -> 5

Participation -> 5

Exam: Outline - Nuclear and Quantum Physics

- atom, nucleons (protons and neutrons) and electrons
- isotopes, nuclides, notation (mass number/atomic number)
- radioactive decay (alpha, beta, gamma)
- half-life, activity, decay constant
- electron-volt
- Planck: quantization of energy
- Einstein: photons and photoelectric effect (work function, cut-off frequency)
- wave-particle duality, deBroglie wavelength
- Bohr: atomic structure, energy level diagrams

Exam: Outline - Thermodynamics

- thermodynamics
- thermal expansion
- Boyle's Law, Charles's Law, Combined Gas Law
- Ideal Gas Law
- Kinetic Theory of Gases (internal energy and kinetic energy)
- Laws of Thermodynamics (0th, 1st, 2nd, 3rd)
- thermal processes (isobaric, isochoric, isothermal, adiabatic)
- heat engines and efficiency
- Carnot's Principle and Engine

Exam: Outline - Optics

- Law of Reflection
- Snell's Law (Refraction)
- Plane Mirror: ray diagram and POST
- Spherical Mirrors:
 - concave (converging) and convex (diverging)
 - labelled ray diagrams and POST
 - mirror and magnification equations (sign conventions)
 - fun house mirrors
- Lenses:
 - index of refraction
 - convex (converging) and concave (diverging)
 - labelled ray diagrams and POST
 - lens and magnification equations (sign conventions)
 - double lens problems

Exam: Outline - Magnetism

- magnetism
- magnetic domains
- magnetic field lines (N \rightarrow S)
- RHR/LHR's #1, 2 and 3
- symbols: in and out of page
- parallel wires
- electric motor: decide direction of armature or I
- force acting on a straight wire
- force acting on a single charged particle
- radius of a single particle in a uniform magnetic field
- velocity selector (perpendicular B and E fields, v)
- mass spectrometer (q to m ratio)
- electromagnetic inductance
- Lenz's Law
- EMF
- Ohm's Law
- self-inductance and mutual inductance
- transformers (primary and secondary coils, turns ratio, power)