Physics 112

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Thursday, May 9/19

FA Duo-Tangs -> Submit Friday

1. Reassessment
   SA - U2: S1&2 -> Date: Noon - Today, May 9/19
2. Submit/Return: FA - Work Problems
3. Concept Sheet - U3 S2 - Types of Energy and Work-Energy Theorems
4. Kinetic Energy
5. Work-Kinetic Energy Theorem
6. Worksheet - Textbook - C6 PP #19-21 -> Kinetic Energy
   Textbook - C6 PP #22-25 -> E_k and W- E_K Theorem

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Submit FA duo-tangs Friday.

1. SA- Experiment 8.1 - Kepler's Laws - Page 49
   - 2 Days Late

2. Questions?
   Worksheet - Kepler's Laws
   Worksheet - Universal Law of Gravitation
   Chapter 12 -> Page 580, PP#1-7
   Worksheets (3) - Kepler's Law, Universal Gravitation, Etc.

3. SA U2 S1&2 - Tuesday, May 14/19

4. Unit 2 - Section 3 - SHM

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1. Questions?
   Worksheet - #63
   Worksheet - #64
   Worksheet - Assigning Oxidation Numbers
   Worksheets - Physic 30 - Unit 6: Redox Reactions & Electrochemistry
   Practice Set 3: Balancing Redox Reactions

2. SA - Electrochemistry
   - Topics
   - Date: Fri. May 10/19.

3. FA - Electrochemistry

4. Extra - Build Table of Half-Reactions
   Predicting Spontaneous Reactions
   Balancing Redox Reactions Using Oxidation Numbers

Science 122 - Electrochemistry

Terms:
electrochemistry, reduction, reducing agent, oxidation, oxidizing agent, half-reaction, redox reaction, spontaneous reaction, oxidation number/state

MC/Short:

- generalizations for r/o agents
- identify oxidation/reduction reactions
- identify oxidizing/reducing agents in reactions
- build a table of redox half-reactions
- predict redox reactions using table of half-reactions
- assign oxidation number/state
- balance redox reactions using oxidation numbers/states

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In the reaction $4\,Fe + 3\,O_2 \rightarrow 2\,Fe_2O_3$, the oxidizing agent is

In the reaction $4\,Fe + 3\,O_2 \rightarrow 2\,Fe_2O_3$, the species oxidized is

What will oxidize __, but not __.

Which half-reaction correctly represents reduction?

For the reaction below, identify the listed substances then use your redox table of half reactions to predict whether the reactions are spontaneous.

Assign oxidation numbers to carbon in each of the following.

For the following situation, use the five-step method outlined in class and the table of redox half reactions to write the most likely redox reaction then state if the reaction is spontaneous.

- Use the evidence from the following chemical reactions and the redox spontaneity rule to develop a table of redox half-reactions. Do not forget a title for the table and other appropriate labels. (6)
- Identify the strongest oxidizing agent and the strongest reducing agent. (2)

Describe each reaction as spontaneous or non-spontaneous.

1. $Au^{3+} + Fe^{3+} \rightarrow Fe^{2+} + Au$ _____

Science 122 - Nuclear Physics

new terms: nucleon, isotope, nuclide, standard atomic notation, nucleon number, radioactive, radioactive decay, transmutation,

alpha decay, alpha particle (α), parent nucleus, daughter nucleus, beta decay, beta particles (electron $^{0}_{-1}e$, positron $^{0}_{+1}e$),

gamma decay (γ), photon, decay series, half-life, activity, decay constant, becquerel, curie, electron-volt, quantum (Planck), photon (Einstein), photoelectric effect, photoelectron, work function, cut-off (threshold) frequency, wave-particle duality,

deBroglie wavelength, excited state, quantum jump, energy level diagrams, binding energy, ionization

short answer:

-> compare terms

-> standard atomic notation

-> transmutations

-> formation of electron in beta decay $n \rightarrow p^+ + e^-$

-> formation of positron in beta decay $p^+ \rightarrow n + e^+$

-> penetration power

-> energy vs frequency graph (photoelectric effect)

-> energy level diagrams

problems: 2 (activity, decay constant, half-life, etc.)

2 (photoelectric effect)

1 quantum jump

1 deBroglie wavelength

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1. FAs - Digits and Rounding

2. Metric Conversions
   *Show work as requested.
   *Shortcut: km/h -> m/s

3. Questions?
   Worksheets - Metric Conversions

4. Optional FA's - Certainty and Precision Rules
   Rearranging Equations
   Metric Conversions

5. SA - Physics #1 - Topics
   - Date: Tuesday, May 14/19

6. Review - SA: Physics #1

7. Roller Coasters

Identifying and Counting Digits

Measurement	# C	# U	#SD
0.00812 cm	2	1	3
4.90×10^2 g	2	1	3

Rounding

Round to 4 SDs.

841.6287 kg → 841.6 kg.

Round to 3 decimal places.

841.6287 kg → 841.629 kg

Round to 2 SDs.

841.6287 kg → 8.4×10^2 kg

8.4×10^2 kg

SA - Physics #1 - Topics

1. definitions: physics, linear motion, physical quantity, significant digits, certainty, exact value, defined value, rounding digit, defining equation

2. SI System - International System of Units
   - know the SI base units for length, time and mass
   - be able to identify a derived unit

3. certainty - identify certain and uncertain digits in a measurement
   - determine the certainty of a measurement by stating its number of significant digits

4. SDs and operation rules - Certainty Rule
   -> multiply and divide
   -> total # of significant digits
   - Precision Rule
   -> add and subtract
   -> # of digits after the decimal

scientific notation

5. rearrange an equation for a specified variable

6. perform metric conversions using conversion factors