

Student Review Matter & Energy Semester B 2009

Test Description

Length: 2 hours

Points: 60 SR (30 Points) 3 BCRs (12 Points) Total = 42 Points

Topic	Approximate Number of Selected Response Items	Approximate Number of Constructed Response Items
Science Process Skills	13	
Molecules to Atoms	17	1
Physical Change	4	1
Solutions and Their Properties	4	
Chemical Changes & Bonding	12	
Chemical & Nuclear Reactions	10	1
Totals	60	3

Some Vocabulary for the Examination

The vocabulary includes words that students may encounter when reading examination items.

Skills & Processes

balance
beaker
bunsen burner
conclusion
control
data
density
dependent variable
experiment
graduated cylinder
hypothesis
independent variable
models
reliability
range (of data)
scientific notation
thermometer
volume
X-axis and Y-axis

Atoms to Molecules

acid
atom
atomic number
bond
charge
compound
electron
electron cloud
energy level
family
fission
formula unit
fusion
group
half-life
ion
ionic bond
isotope
mass number
metal
molecule

monomer
neutron
nucleus (nuclei)
oxidation number
period
periodic table
polar
proton
radioactive
subatomic particle
valence electron

Physical Change

average kinetic energy
boiling point
energy
freezing point
gas
heating curve
liquid
mass
melting point

Student Review

Matter & Energy Semester B 2009

Physical Change

(continued)

phase change
phases of matter
physical change
solid
states of matter

Chemical Changes &

Bonding

chemical reaction
products
reactants
reactivity
synthesis

Solution and Their Properties

acid (strong vs. weak)
base (strong vs. weak)
concentration
indicator
pH
precipitate
solubility
solute
solution
solvent
universal solvent

Chemical & Nuclear Reactions

alpha particle
balanced equation
beta particle
catalyst
conservation of energy
decay
decomposition
fission
fusion
gamma
Law of Conservation of
Matter
reaction rate

Upon successful completion of Semester B, the student should be able to:

Skills and Processes

- read and interpret a technical passage.
- interpret graphs and diagrams.
- check graphs to determine that they do not misrepresent results.
- recognize safe laboratory procedures.
- identify meaningful, answerable, scientific questions.
- identify appropriate methods for conducting an investigation.
- identify the hypothesis of an experiment.
- identify the control in an experiment.
- distinguish between a dependent variable and an independent variable.
- identify the appropriate instruments and materials needed to conduct an experiment.
- defend the need for verifiable data.
- organize data using appropriate techniques.
- identify trends revealed by data.
- analyze data to form conclusions.
- use analyzed data to confirm, modify or reject a hypothesis.
- express large numbers using scientific notation.

Molecules to Atoms

- determine the number of protons or neutrons in an element.
- explain how a neutral atom becomes an ion.
- determine the number of atoms of an element in a compound based on the formula.
- determine the ratio of elements found in a compound from a model.
- identify properties of subatomic particles.
- identify the shape of a polar or non-polar molecule.
- describe the relationship between polar solvents and ions.

Student Review

Matter & Energy Semester B 2009

Chemical Changes and Bonding

- predict which element will be more reactive based on its location in the periodic table.
- predict the number of valence electrons in an element based on its location in the periodic table.
- predict the oxidation number of an element based on its location in the periodic table.
- predict the number of atoms in a compound using oxidation numbers.
- predict the location of an element in the periodic table based on the number of electrons in its outer energy level.
- identify the correct formula for a compound given the oxidation numbers.
- describe how an ionic bond forms between atoms.
- identify the formula of a monomer that bonds to form a polymer.

Physical Change

- use a heating curve to identify states of matter.
- use a heating curve to identify where phase changes occur.
- use a heating curve to identify changes in kinetic energy of a substance.

Solutions and Their Properties

- identify the solute and solvent in a solution.
- compare the solubility of two solids in water.
- characterize substances as acids or bases according to pH value.

Chemical and Nuclear Reactions

- identify factors that change the rates of chemical reactions
- identify the equation for a synthesis reaction.
- explain the Law of Conservation of Matter utilizing data.
- identify equations that illustrate the Law of Conservation of Matter.
- identify a decomposition reaction.
- identify the process during which atoms split or fuse.
- calculate amount of decay based on the half-life of an element.

Useful Websites:

This review can be found online at:

<http://www.montgomeryschoolsmd.org/curriculum/science/classroom/assessment/>

The format of the MCPS semester examination mirrors the Public Release Version of the Biology High School Assessment. The PRV items can be viewed at:

http://www.mdk12.org/assessments/high_school/look_like/biology/intro.html