

Chemistry - Mrs. Bauck, PHUHS
Unit 10: Thermochemistry - Chapter 14 (Chem 1H)

State Standards (***) = Chem 1H only)

Topic 1: Forms and Transformations of Energy

SC.912.P.10.1 Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.

Topic 2: Endothermic and Exothermic Reactions

SC.912.P.10.6 Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.

SC.912.P.10.7 Distinguish between endothermic and exothermic chemical processes.

***SC.912.P.10.8 Explain entropy's role in determining the efficiency of processes that convert energy to work.

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| 4.0 | Extensions/Applications | <p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Describe how a fusion nuclear power plant is set up. <input type="checkbox"/> Explain how Tokamak magnetic fields work. <input type="checkbox"/> Solve advanced calorimetry problems. |
| 3.0 | Learning Goal (Derived from State Standard) | <p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Explain that energy is involved in all physical and chemical processes. <input type="checkbox"/> Explain how at the atomic and nuclear levels energy is not continuous but exists in discrete amounts. <input type="checkbox"/> Explain how energy and mass are related through Einstein's equation. $E=mc^2$. <input type="checkbox"/> Describe how properties of atomic nuclei are responsible for energy-related phenomena such as radioactivity, fission and fusion. <input type="checkbox"/> Understand that changes in entropy and energy that accompany chemical reactions influence reaction paths. <input type="checkbox"/> Understand that chemical reactions result in the release or absorption of energy. <input type="checkbox"/> Compare and contrast endothermic and exothermic reactions. <input type="checkbox"/> Understand that the theory of electromagnetism explains that electricity and magnetism are closely related. Electric charges are the source of electric fields. Moving charges generate magnetic fields. <input type="checkbox"/> Understand that em waves are the propagation of a disturbance. They transport energy and momentum but do not transport matter. <input type="checkbox"/> Solve specific heat problems, typically for q or c. <input type="checkbox"/> Define enthalpies of reaction, combustion, formation. (chemical changes) <input type="checkbox"/> Define enthalpies of fusion, vaporization, solidification, condensation, solution. (physical changes) <input type="checkbox"/> Explain Hess' Law and work corresponding problems. <input type="checkbox"/> Explain the Gibb's free energy equation and work corresponding problems. |

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| 2.0 | Required Skills or Background Knowledge to accomplish Learning Goal | <p>Students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Summarize the Law of Conservation of Energy and give examples. <input type="checkbox"/> Explain how energy is quantized in an atom. <input type="checkbox"/> Define radioactivity. <input type="checkbox"/> Compare and contrast fission and fusion. <input type="checkbox"/> Give a basic definition of endothermic and exothermic reactions. <input type="checkbox"/> Define kinetic energy and potential energy. <input type="checkbox"/> Write and balance chemical equations. |
| 1.0 | With help from the teacher, student has partial success with the goal | <p>With help from a teacher, students will be able to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Achieve partial success with 2.0 and/or 3.0. |
| 0.0 | Even with help, the student has no success with the goal | <ul style="list-style-type: none"> <input type="checkbox"/> Even with help, student is unable to understand or complete any of the skills in scales 1.0 through 4.0. |