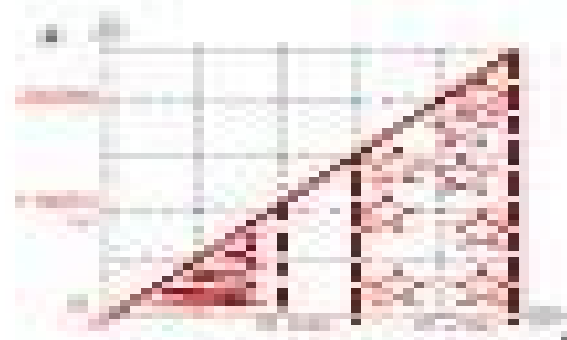


Energy Storage and Transfer Model Worksheet 2: Hooke's Law and Elastic Energy

Suppose that Hooke's Law is valid for a spring that obeys Hooke's Law. Graphically represent the relationship between displacement and force for a spring that obeys Hooke's Law. Label each of the quantities represented on the axes.



1. Graphically represent the relationship of energy stored within a spring and the spring's displacement when the force is 10 N. Displacement is 0.1 m. The area under the line is shaded in red.

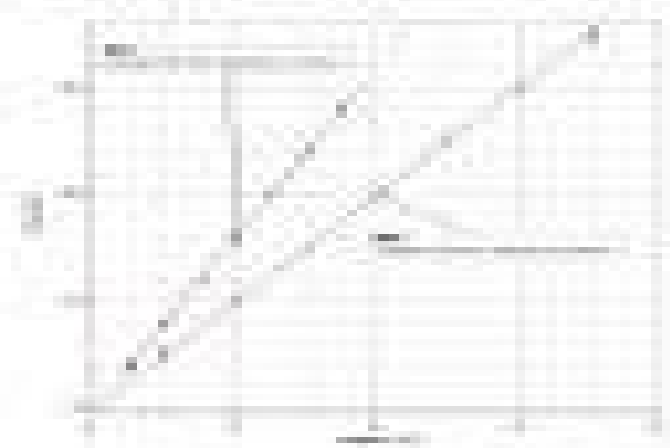
2. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(10\text{ N})(0.1\text{ m}) = 0.5\text{ J}$.

3. Graphically represent the relationship of energy stored within a spring and the spring's displacement when the force is 10 N and the displacement is 0.2 m. The area under the line is shaded in red.

4. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(10\text{ N})(0.2\text{ m}) = 1\text{ J}$.

5. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(10\text{ N})(0.3\text{ m}) = 1.5\text{ J}$.

Now graph Force versus Displacement for a spring that obeys Hooke's Law. The area under the line is shaded in red. The area under the line is shaded in red. The area under the line is shaded in red.



6. A spring that obeys Hooke's Law has a spring constant of 100 N/m.

7. The spring constant is 100 N/m. The area under the line is shaded in red.

8. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.1\text{ m}) = 5\text{ J}$.

9. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.2\text{ m}) = 10\text{ J}$.

10. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.3\text{ m}) = 15\text{ J}$.

11. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.4\text{ m}) = 20\text{ J}$.

12. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.5\text{ m}) = 25\text{ J}$.

13. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.6\text{ m}) = 30\text{ J}$.

14. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.7\text{ m}) = 35\text{ J}$.

15. The area under the line is $\frac{1}{2}Fx = \frac{1}{2}(100\text{ N/m})(0.8\text{ m}) = 40\text{ J}$.

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Juergen Wiegel, Adams W.W. Michael

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World Congress III of Chemical Engineering, 1986 **Preparation and Properties of 2D Materials** Byungjin Cho, Yonghun Kim, 2020-12-10 Since the great success of graphene atomically thin layered nanomaterials called two dimensional 2D materials have attracted tremendous attention due to their extraordinary physical properties Specifically van der Waals heterostructured architectures based on a few 2D materials named atomic scale Lego have been proposed as unprecedented platforms for the implementation of versatile devices with a completely novel function or extremely high performance shifting the research paradigm in materials science and engineering Thus diverse 2D materials beyond existing bulk materials have been widely studied for promising electronic optoelectronic mechanical and thermoelectric applications Especially this Special Issue included the recent advances in the unique preparation methods such as exfoliation based synthesis and vacuum based deposition of diverse 2D materials and also their device applications based on interesting physical properties Specifically this Editorial consists of the following two parts Preparation methods of 2D materials and Properties of 2D materials **Thermophiles** Juergen Wiegel, Adams W.W. Michael, 1998-08-27 Late 1990s developments in the study of thermophiles have had considerable significance on theories of evolution These micro organisms are able to thrive at temperatures near or even above 100 degrees Celsius and scientists have begun to study their biology in an attempt to provide clues about the beginnings of life on our planet Researchers *Key Concepts* Glen Phelan, 2014

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web these ions are called spectator ions because they do not participate in the actual reaction canceling the spectator ions gives the net ionic equation which shows only those species that participate in the chemical reaction $2\text{Ag}^+ \text{aq} + \text{CrO}_4^{2-} \text{aq} \rightarrow \text{Ag}_2\text{CrO}_4 \text{s}$

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web mar 11 2014 solution ionic equation $\text{H}^+ \text{aq} + \text{Cl}^- \text{aq} + \text{Na}^+ \text{aq} + \text{HCO}_3^- \text{aq} \rightarrow \text{Na}^+ \text{aq} + \text{Cl}^- \text{aq} + \text{H}_2\text{O} \text{l} + \text{CO}_2 \text{g}$ the spectator ions are Cl^- and Na^+ net ionic equation $\text{H}^+ \text{aq} + \text{HCO}_3^- \text{aq} \rightarrow \text{H}_2\text{O} \text{l} + \text{CO}_2 \text{g}$ here is a video on spectator ions *chapter 8 04 ionic equations chemistry libretexts* - Mar 06 2023

web the six $\text{NO}_3^- \text{aq}$ ions and the six $\text{Na}^+ \text{aq}$ ions that appear on both sides of the equation are spectator ions that can be canceled to give the net ionic equation $3\text{Ba}^{2+} \text{aq} + 2\text{PO}_4^{3-} \text{aq} \rightarrow \text{Ba}_3(\text{PO}_4)_2 \text{s}$

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changed by the process and so they may be eliminated from the equation to yield a more succinct representation called a **practice problems on net ionic equations chem kmacgill com** - Sep 12 2023

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 $\text{AgNO}_3 \text{ aq} + \text{KCl aq} \rightarrow \text{AgCl s} + \text{KNO}_3 \text{ aq}$ total ionic $\text{Ag}^+ \text{ aq} + \text{NO}_3^- \text{ aq} + \text{K}^+ \text{ aq} + \text{Cl}^- \text{ aq} \rightarrow \text{AgCl s} + \text{K}^+ \text{ aq} + \text{NO}_3^- \text{ aq}$ net ionic $\text{Ag}^+ \text{ aq} + \text{Cl}^- \text{ aq} \rightarrow \text{AgCl s}$

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web the equation below is the final net ionic equation after elimination of the spectator ions which yields water $\text{H}^+ \text{ aq} + \text{OH}^- \text{ aq} \rightarrow \text{H}_2\text{O l}$ the spectator ions in KOH aq and $\text{HNO}_3 \text{ aq}$ are $\text{K}^+ \text{ aq}$ and $\text{NO}_3^- \text{ aq}$ how to identify and list the

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web the $\text{Ag}^+ \text{ aq}$ and $\text{Cl}^- \text{ aq}$ ions become AgCl s but the $\text{Na}^+ \text{ aq}$ ions and the $\text{NO}_3^- \text{ aq}$ ions stay as $\text{Na}^+ \text{ aq}$ ions and $\text{NO}_3^- \text{ aq}$ ions these two ions are examples of spectator ions ions that do nothing in the overall course of a chemical reaction

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web the new format requires students to write balanced chemical equations showing only the reacting substances excluding spectator ions for three different sets of reactants and to answer a short question requiring no calculator about each reaction the questions are intended to test the students understanding of the meaning of the reactions

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web jun 2 2023 the spectator ions are cut out from a reaction hence the net ionic equation for the above reaction would be $2\text{Cl}^- \text{aq} + \text{Cu}^{2+} \text{aq} \rightarrow \text{Cu}^{2+} \text{aq} + 2\text{Cl}^- \text{aq}$ these spectator ions are not actively involved in the reaction the existence of spectator ions affects the debye length