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Periodic Trends Webquest

For the past few days we've been studying trends on the periodic table. Ionization energy increases this way...electronegativity decreases that way...atomic radius gets bigger over there and smaller over here...

Talk, talk, talk. That's all we've been doing. You listen to me, you write stuff down (maybe), and I keep my fingers crossed that you learn something. Today, however, your goal is to find the data to back up these mythical trends that I've been talking at you about.

Your assignment is to use the internet resources found below to research each of the trends. This data should be entered into each of the blank periodic tables, and then you are to answer a few questions about each trend.

Questions for each trend:

- What units do your numbers / measurements use?
- Which element has the greatest (whatever the trend is)? Which element has the smallest (whatever the trend is)?
- What is the general trend in (whatever the trend is)?
- What element(s) do(es) not fit the pattern?
- Explain the horizontal / periodic trend using words like magnet and such.
- Explain the group / vertical trend using words like shielding and such.
- Pick one of the elements that doesn't fit the pattern and explain why it doesn't follow the trend.

Recommended resources

www.webelements.com/
Web Elements - best periodic table on the web

www.chemicool.com/
CehmiCool periodic table - another periodic table with thorough info for every element

www.chemsoc.org/viselements/pages/periodic_table.html
Visual periodic table - excellent graphics, good information on each element

pearl1.lanl.gov/periodic/default.htm
Los Alamos National Labs webpage with very current info - especially on the heaviest elements

www.tulane.edu/~bmitche/book/ietab.html
A periodic table from Tulane University down in the Big Easy

www.shodor.org/chemviz/ionization/students/background.html
A good, semi-visual explanation of how first ionization energies work

chemed.chem.purdue.edu/genchem/topicreview/bp/ch7/ie_ea.html
A very through explanation of how first ionization energy trends work

www.science.co.il/PTelements.asp?s=Density
Data about the elements sortable by various aspects.

web.mit.edu/course/3/3.091/www3/pt/
An MIT student's preoject periodic table with data for many aspects of each element...and pretty colors, too...

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Part I: Categories of Elements on the Periodic Table

Objective: To discover the important sections of elements on the periodic table.
Lesson: Go to http://www.chem4kids.com/files/elem_pertable.html and follow the links to answer the questions on your answer sheet.

Periodic Table –

What is a group?

What is a period?

Families - How are elements grouped into families?

Metals – Approximately what % of elements do metals make up?

Alkali metals - Who's in? Who's out? What are some properties of the alkali metals?

Lanthanide Series (part of the inner transition metals) - Under "Meet the Family", what is unique about the actinide series?

Halogens - How many electrons do halogens have in their valence energy levels? What do halogens like to react with?

Inert gases (noble gases) - Why are they happy?

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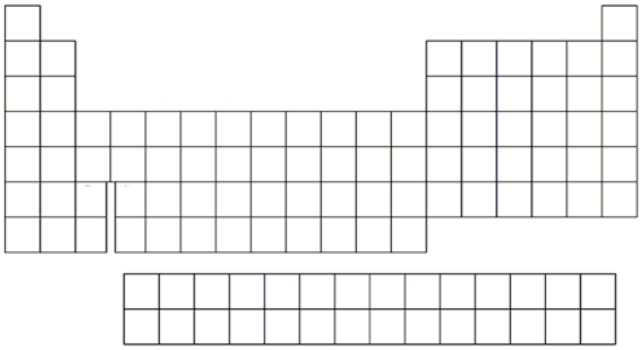
Atomic Radii



1. What units of measurement are used for this trend?
   _____

2. Which element has the greatest atomic radius? Smallest atomic radius?
   _____
   _____

3. What is the general trend of atomic radius? Show trend on periodic table above with arrows.
   _____

4. What element(s) do(es) not fit the pattern?
   _____

5. Explain the horizontal / periodic trend using terms like “effective nuclear force”.
   _____
   _____
   _____
   _____

6. Explain the group / vertical trend using terms like “electron shielding”.
   _____
   _____
   _____
   _____

7. Pick one of the elements that doesn't fit the overall trend, and explain why.
   _____
   _____
   _____
   _____

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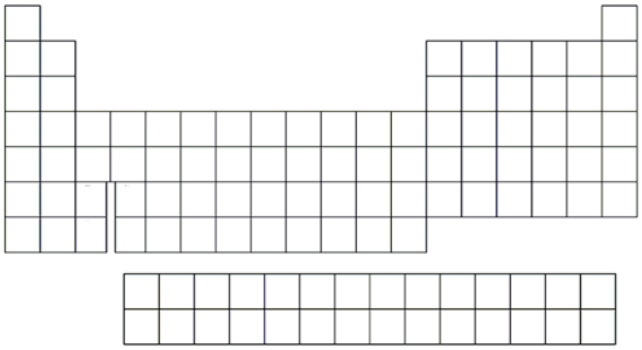
Ionization Energy



1. What units of measurement are used for this trend?
   _____

2. Which element has the greatest ionization energy? Smallest ionization energy?
   _____
   _____

3. What is the general trend in ionization energy? Show trend on periodic table above with arrows.
   _____

4. What element(s) do(es) not fit the pattern?
   _____

5. Explain the horizontal / periodic trend using terms like “effective nuclear force”.
   _____
   _____
   _____
   _____

6. Explain the group / vertical trend using terms like “electron shielding”.
   _____
   _____
   _____
   _____

7. Pick one of the elements that doesn't fit the overall trend, and explain why.
   _____
   _____
   _____
   _____

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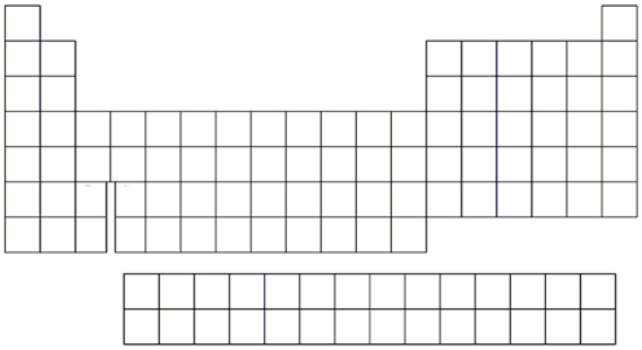
Electron Affinity



1. What units of measurement are used for this trend?
   _____

2. Which element has the greatest electron affinity? Smallest electron affinity?
   _____
   _____

3. What is the general trend in electron affinity? Show trend on periodic table above with arrows.
   _____

4. What element(s) do(es) not fit the pattern?
   _____

5. Explain the horizontal / periodic trend using terms like “effective nuclear force”.
   _____
   _____
   _____
   _____

6. Explain the group / vertical trend using terms like “electron shielding”.
   _____
   _____
   _____
   _____

7. Pick one of the elements that doesn't fit the overall trend, and explain why.
   _____
   _____
   _____
   _____

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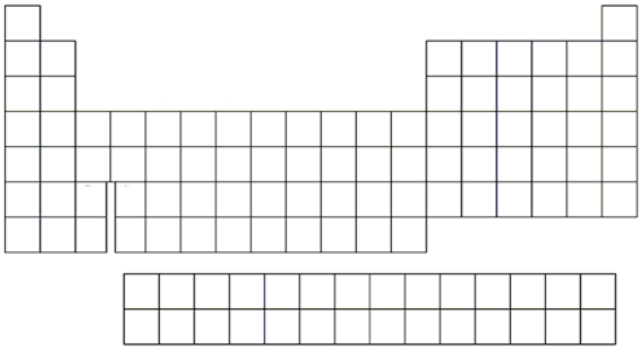
Electronegativity



1. What units of measurement are used for this trend?
   _____
2. Which element has the greatest electronegativity? Smallest electronegativity?
   _____
   _____
3. What is the general trend in electronegativity? Show trend on periodic table above with arrows.
   _____
4. What element(s) do(es) not fit the pattern?
   _____
5. Explain the horizontal / periodic trend using terms like “effective nuclear force”.
   _____
   _____
   _____
   _____
6. Explain the group / vertical trend using terms like “electron shielding”.
   _____
   _____
   _____
   _____
7. Pick one of the elements that doesn't fit the overall trend, and explain why.
   _____
   _____
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