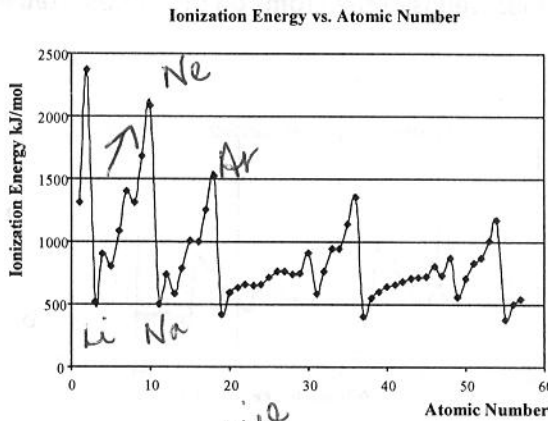
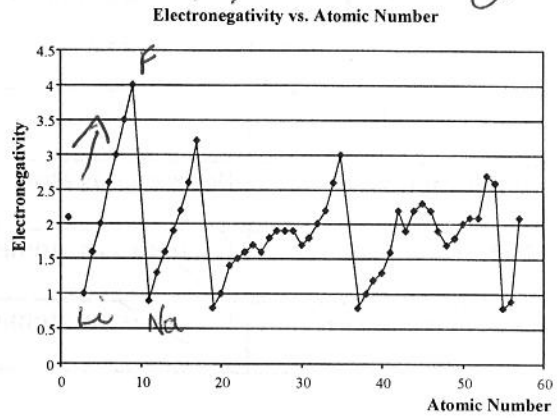
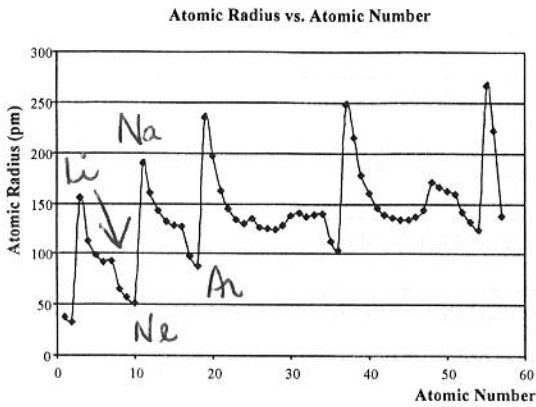


Trends in the Periodic Table

Consider the following graphs that compare the atomic radius, electronegativity, and ionization energy to atomic number.



assigned ϕ !!
 no inert gases i.e. noble gases on this table

the ability to attract an e^- - the E required to remove an e^- from an atom

Which table correctly describes the trends for atomic radius, electronegativity, and ionization energy within any given period of the periodic table?

PROPERTY	TREND
Atomic radius	Increases as atomic number increases \rightarrow
Electronegativity	Increases as atomic number increases \checkmark
Ionization energy	Decreases as atomic number increases

B)

PROPERTY	TREND
Atomic radius	Decreases as atomic number increases \checkmark atoms become smaller \rightarrow
Electronegativity	Increases as atomic number increases \checkmark $M \rightarrow NM$
Ionization energy	Increases as atomic number increases \checkmark it requires more work/energy to pull an e^- off a NM compared to a M

C)

PROPERTY	TREND
Atomic radius	Decreases as atomic number increases
Electronegativity	Decreases as atomic number increases
Ionization energy	Increases as atomic number increases

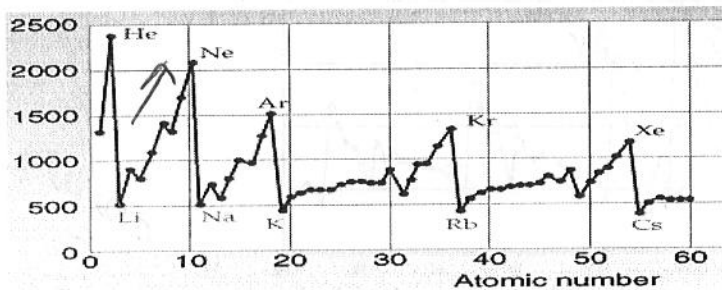
D)

PROPERTY	TREND
Atomic radius	Decreases as atomic number increases
Electronegativity	Decreases as atomic number increases
Ionization energy	Decreases as atomic number increases

2

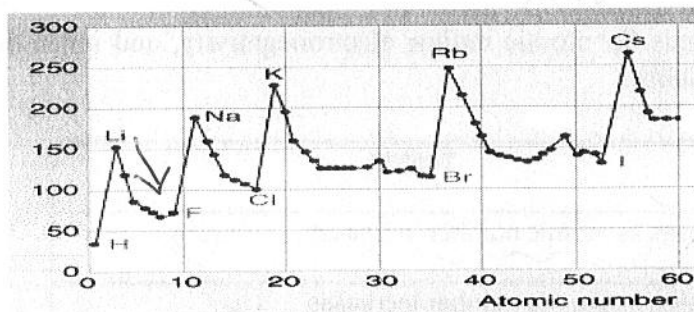
The following graphs illustrate various trends of the atoms on the periodic table.

I



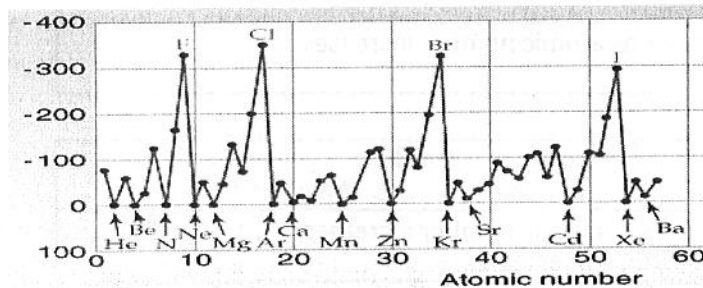
↑ across a period
• could be IE

II



↓ across a period
• could be radius

III



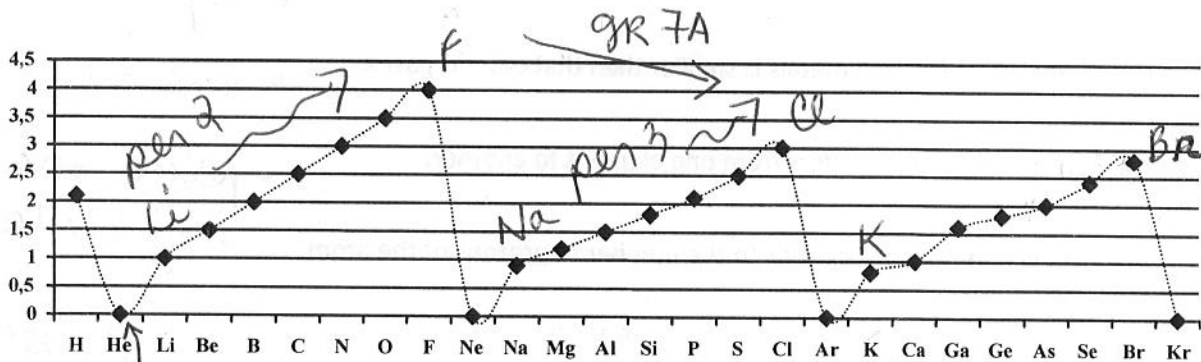
no pattern!
bp/mp?

Which graphs represent the trend for ionization energy and for atomic radius?

- A) Ionization energy - I
Atomic radius - II
- B) Ionization energy - ~~III~~
Atomic radius - ~~II~~ ✓
- C) Ionization energy - ~~III~~
Atomic radius - ~~III~~
- D) Ionization energy - I ✓
Atomic radius - ~~III~~

↑ across a period

3 The graph below shows the electronegativity index of some elements of the periodic table.



Noble gas assigned electronegativity values of 0 because they do not attract e^- .

Which of the following statements is true?

- ~~A)~~ The electronegativity index steadily increases within the same family. = GR = $\left. \begin{matrix} G \\ R \\ P \\ C \\ O \\ R \end{matrix} \right\} \downarrow$
- B) The electronegativity index steadily increases, then drops to 0 within the same period.
- ~~C)~~ The electronegativity index remains constant within the same family period as one goes from left to right on the periodic table.
- ~~D)~~ The electronegativity index steadily decreases within the same period.

4

Which of the following elements has the greatest atomic radius?

biggest size of the atom

- A) Boron (B)
- B) Lithium (Li)**
- C) Neon (Ne)
- D) Nitrogen (N)

Li → B → N → Ne

across a period atomic size ↓ bec. the Fatl ↑ →

the mass depends on the # of p⁺ + the # of n⁰

5

In parts of the periodic table, as the atomic number increases, the atomic mass decreases. Argon (Ar) and potassium (K) are examples of this.

Which of the following statements helps to explain this irregularity?

- A) The radius of an atom increases with the period number.
- B) The atomic mass of alkali metals is smaller than that of inert gases.
- C) The number of isotopes differs from one element to another.**
- D) The atomic number corresponds to the number of protons of the atom.

discrepancies

- #p⁺ ↑ steadily
- the # n⁰ does not

plus the # of isotopes +

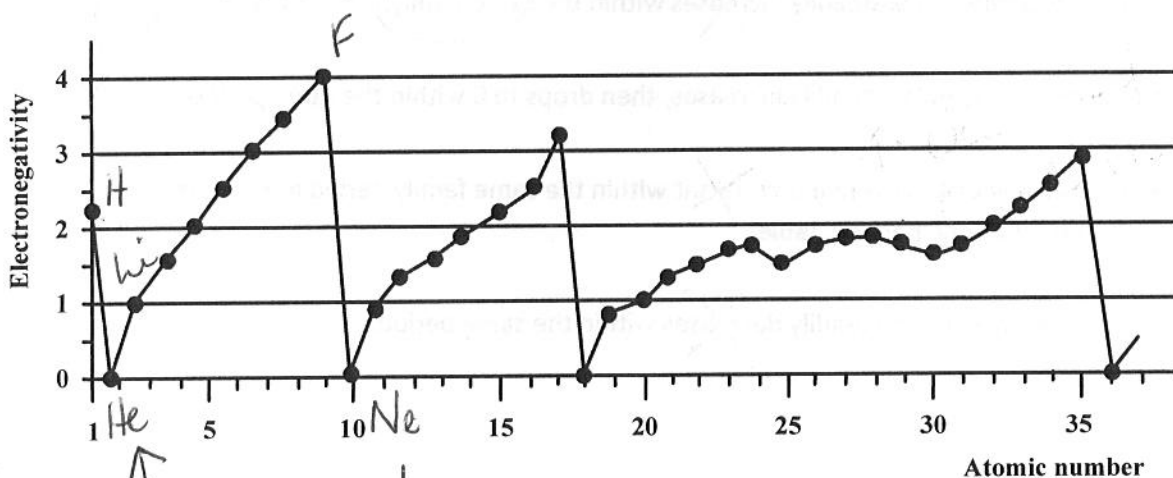
the mass of the isotopes + the

% of the isotopes varies

6

The graph below shows the electronegativity of some elements.

Describe: the progression of this property for elements within the 3rd period on the periodic table.



bad graph!

data pts not right on the numbers!

suck it up in June!

7 In the Periodic Table of the Elements, there is a regular progression of properties from left to right across each period.

→ ↓ radius

Certain properties are shown below. Which properties show a decrease as the atomic number increases within the same period? = across a period = →

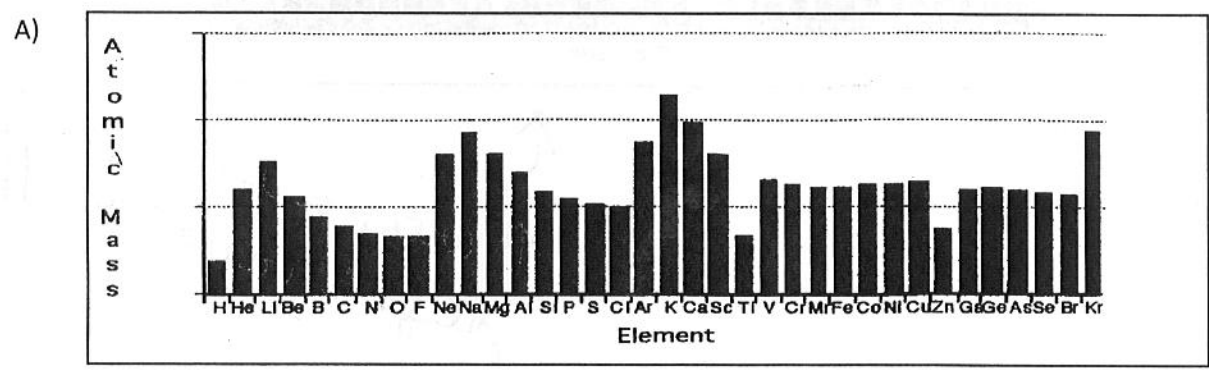
- 1. Density ↓ bec M → NM (gases!) ✗ Ability to gain an electron ↑ bec as you go across
 - 2. Melting point S → G! ✗ Number of energy levels Fatt ↑ + m' turn it NM
 - 3. Atomic radius ✓ yes ✗ Atomic mass ↓ tends to ↑ bec of ↑ #p⁺ + ↑ #n^o in gen! = gen! the # of EL is the same across a period! per 2 = 2EL →
- ↑ the only 1 you know for sure.
- A) 1-2-3
 - B) 1-2-5
 - C) 3-4-6
 - D) 4-5-6

* tends to ↑ across a period & down the group

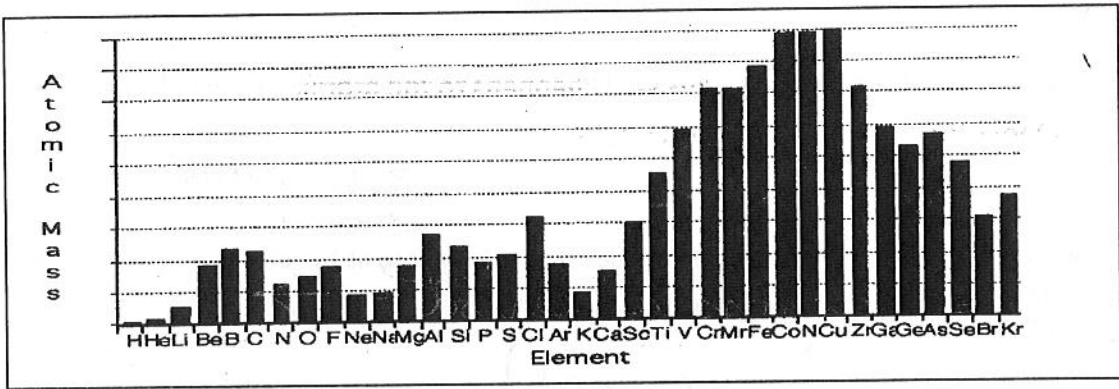
↑ #p⁺ =

↑ #n^o L. in genera

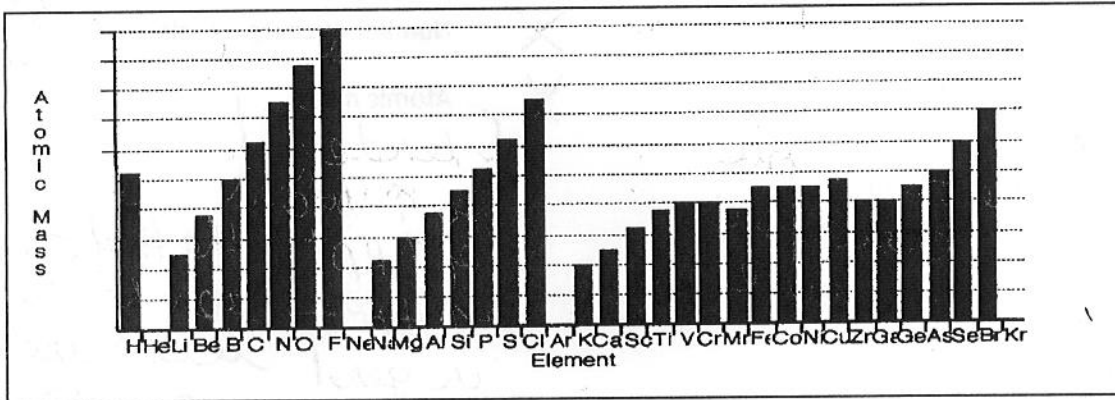
8 Which one of the following graphs represents the progression of the atomic masses in the periodic table?



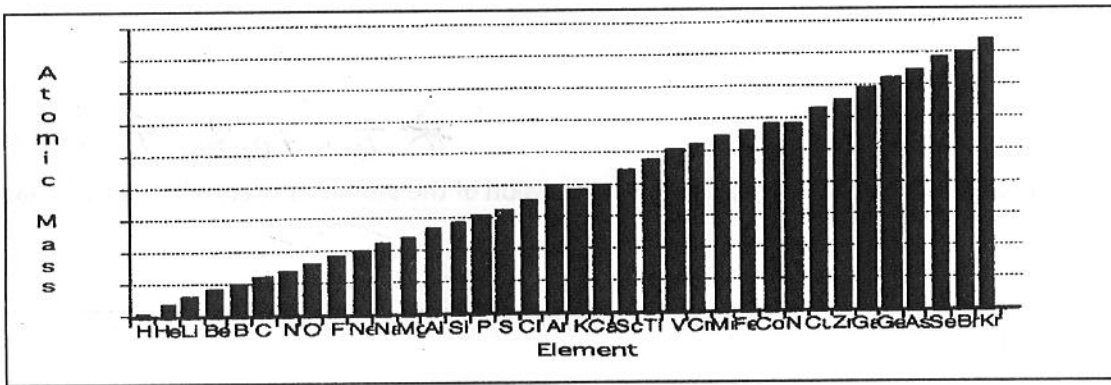
B)



C)



D)



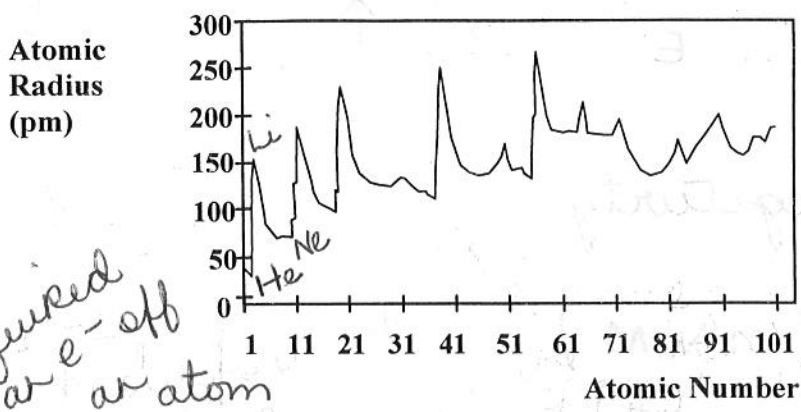
↑
 ↑ with a few slight variations !!

9

Based on the graphs below, in general terms what happens to the atomic radius and ionization energy as the atomic number increases across a given period? →

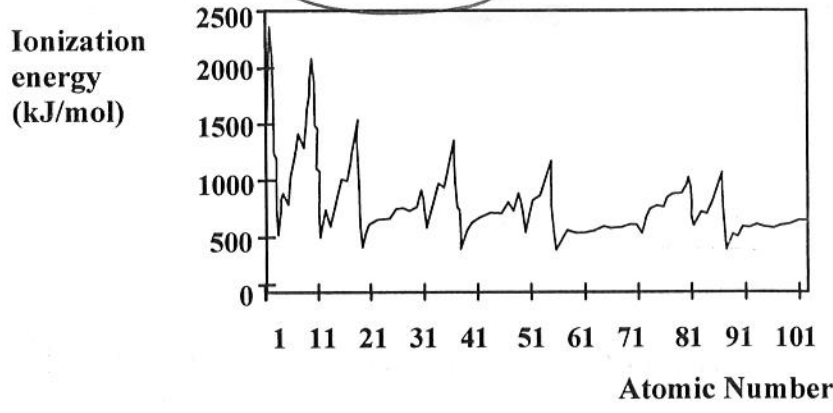
size of the atoms

Atomic Radius vs. Atomic Number



the E required to pull an e⁻ off an atom

Ionization Energy vs. Atomic Number



can you read this graph? I can't! but I know the trend! so I'm ok!

know your trends!

- A) As the atomic number increases, both the atomic radius and ionization energy generally increase.
- B) As the atomic number increases, both the atomic radius and ionization energy generally decrease.
- C) As the atomic number increases, the atomic radius generally increases and the ionization energy generally decreases.
- D) As the atomic number increases, the atomic radius generally decreases and the ionization energy generally increases.

trends

→
across

↓
down

1) atomic radius ↓

2) ionization E ↑

3) electronegativity ↑

4) density (m → NM) ↓

5) lp (5 → 6) ↓