

name: \_\_\_\_\_

date: \_\_\_\_\_

## trends on the periodic table - practice problems

**Directions:** Answer each of the following questions.

1. Define each of the following vocabulary terms:

a. atomic radius

b. ionic radius

c. ionization energy

d. electron affinity

e. electronegativity

2. State how each trend changes (increases / decreases) within a **group**.

3. State how each trend changes (increases / decreases) across a **period**.

4. What factor(s) is/are responsible for how trends change within a **group**?

5. What factor(s) is/are responsible for how trends change across a **period**?

6. Would the valence electron(s) be held onto more strongly in lithium or neon? Explain.

7. Would the valence electron(s) be held onto more strongly in magnesium or calcium? Explain.

8. Would it be 'easier' for aluminum or chlorine to *accept* an electron into? Explain.

9. Would it be 'easier' for bromine or iodine to *accept* an electron into? Explain.

10. Define '**electron shielding**.' How (if at all) does the amount of shielding change within a group? Across a period?

11. Would an *increased* amount of electron shielding make it easier or more difficult to remove an electron from an atom? Explain.

12. Would an *increased* amount of electron shielding make it easier or more difficult to add an electron to an atom? Explain.

13. Choose the atom with the **larger** atomic radius:

a. As or Se

b. At or Cl

14. Choose the atom with the **higher** ionization energy:

a. Li or B

b. K or Rb

15. Choose the atom with the **higher** electron affinity:

a. Al or Na

b. N or P

16. Choose the atom with the **higher** electronegativity:

a. N or O

b. Cl or F

# trends on the periodic table - practice problems

**Directions:** Answer each of the following questions.

1. Define each of the following vocabulary terms:

a. atomic radius

distance btwn. nucleus and valence e<sup>-</sup> (atom)

c. ionization energy

energy required to lose an electron

e. electronegativity

ability of an atom to control another atoms electrons

b. ionic radius

distance btwn. nucleus and valence e<sup>-</sup> (ion)

d. electron affinity

energy released as an electron is gained

2. State how each trend changes (increases / decreases) within a **group**.

**a.** inc. down a group, **b.** inc. down a group, **c.** dec. down a group, **d.** dec. down a group, **e.** dec. down a group

3. State how each trend changes (increases / decreases) across a **period**.

**a.** dec. across a period, **b.** dec. across a period, **c.** inc. across a period, **d.** inc. across a period, **e.** inc. across a period

4. What factor(s) is/are responsible for how trends change within a **group**?

number of filled inner energy levels

5. What factor(s) is/are responsible for how trends change across a **period**?

amount of protons in the nucleus

6. Would the valence electron(s) be held onto more strongly in lithium or neon? Explain.

Ne, more protons than Li; same period

7. Would the valence electron(s) be held onto more strongly in magnesium or calcium? Explain.

Mg, smaller amount of filled inner energy levels, less shielding; same group

8. Would it be 'easier' for aluminum or chlorine to *accept* an electron into? Explain.

Cl, more protons than Al; same period

9. Would it be 'easier' for bromine or iodine to *accept* an electron into? Explain.

Br, smaller amount of filled energy levels, less shielding; same group

10. Define '**electron shielding**.' How (if at all) does the amount of shielding change within a group? Across a period?

the degree to which filled inner shells block valence electrons from the full pull of the nucleus; shielding increases down a group and remains constant moving across a period

11. Would an *increased* amount of electron shielding make it easier or more difficult to remove an electron from an atom? Explain.

easier; valence electrons would be held onto less tightly

12. Would an *increased* amount of electron shielding make it easier or more difficult to add an electron to an atom? Explain.

more difficult; nucleus would be less able to 'pull' an electron into the valence shell

13. Choose the atom with the **larger** atomic radius:

a. As or Se

b. At or Cl

14. Choose the atom with the **higher** ionization energy:

a. Li or B

b. K or Rb

15. Choose the atom with the **higher** electron affinity:

a. Al or Na

b. N or P

16. Choose the atom with the **higher** electronegativity:

a. N or O

b. Cl or F