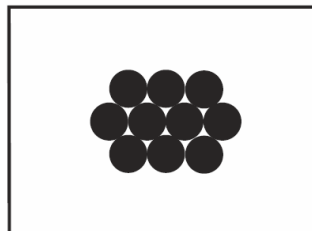
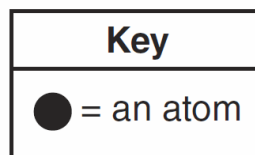


The Atom/Periodic Table After School Regents Review Practice

1. An ion that consists of 7 protons, 9 neutrons, and 10 electrons has a net charge of
A) 2- B) 2+ C) 3+ **D) 3-**
2. The mass of a proton is approximately equal to the mass of
A) an electron **B) a neutron**
C) an alpha particle D) a beta particle
3. What is the number of electrons in an atom that has 20 protons and 17 neutrons?
A) 37 **B) 20** C) 3 D) 17
4. Which phrase describes an Al atom?
A) a negatively charged nucleus, surrounded by negatively charged electrons
B) a negatively charged nucleus, surrounded by positively charged electrons
C) a positively charged nucleus, surrounded by negatively charged electrons
D) a positively charged nucleus, surrounded by positively charged electrons
5. Which conclusion was drawn from the results of the gold foil experiment?
A) An atom is electrically neutral.
B) An atom is mostly empty space.
C) The nucleus of an atom is negatively charged.
D) The electrons in an atom are located in specific shells.

6. Given the particle diagram:



Which substance at STP can be represented by this particle diagram?

- A) N₂ B) H₂ **C) Mg** D) Kr
7. All phosphorus atoms have the same
A) atomic number
B) mass number
C) number of neutrons plus the number of electrons
D) number of neutrons plus the number of protons
 8. The atomic mass of an element is the weighted average of the atomic masses of
A) the least abundant isotopes of the element
B) the naturally occurring isotopes of the element
C) the artificially produced isotopes of the element
D) the natural and artificial isotopes of the element

The Atom/Periodic Table After School Regents Review Practice

9. The table below gives the atomic mass and the abundance of the two naturally occurring isotopes of bromine.

**Naturally Occurring Isotopes
of Bromine**

Isotopes	Atomic Mass (u)	Natural Abundance (%)
Br-79	78.92	50.69
Br-81	80.92	49.31

Which numerical setup can be used to calculate the atomic mass of the element bromine?

- A) $(78.92 \text{ u})(50.69) + (80.92 \text{ u})(49.31)$
B) $(78.92 \text{ u})(49.31) + (80.92 \text{ u})(50.69)$
C) **$(78.92 \text{ u})(0.5069) + (80.92 \text{ u})(0.4931)$**
D) $(78.92 \text{ u})(0.4931) + (80.92 \text{ u})(0.5069)$
10. Which electron configuration represents the electrons of an atom of neon in an excited state?
A) 2-7 B) 2-8 C) **2-7-1** D) 2-8-1
11. Which term is defined as the region in an atom where an electron is most likely to be located?
A) nucleus **B) orbital**
C) quanta D) spectra
12. Which atom in the ground state has the same electron configuration as a calcium ion, Ca^{2+} , in the ground state?
A) **Ar** B) K C) Mg D) Ne
-

The Atom/Periodic Table After School Regents Review Practice

Base your answers to questions 13 and 14 on the information below and on your knowledge of chemistry.

Rubidium and iodine have different chemical and physical properties. Some of these properties are shown in the table below.

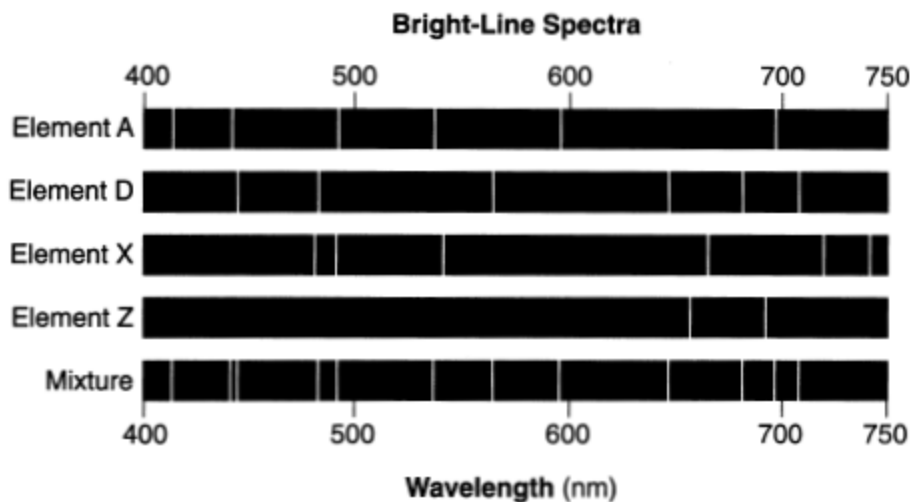
Some Physical and Chemical Properties of Rubidium and Iodine

Rubidium	Iodine
silvery-white solid	bluish-black lustrous solid
forms ionic compounds with nonmetals	forms ionic bonds with active metals
reacts with oxygen in the air	sublimes at room temperature
specific heat = 0.363 J/g•K	specific heat = 0.214 J/g•K

13. Compare the electrical conductivity of these two elements at STP.
14. State the chemical property of iodine listed in this table.

Base your answers to questions 15 and 16 on the information below and on your knowledge of chemistry.

The bright-line spectra for four elements and a mixture of elements are shown in the diagram below.



15. Explain, in terms of electrons and energy states, how the light emitted by excited atoms is produced.
16. Write the letter of each element present in the mixture.
-
17. Compare the energy of an electron in the first shell of a cadmium atom to the energy of an electron in the third shell of the same atom.
18. Explain, in terms of electron configuration, why arsenic and antimony are chemically similar.
-

The Atom/Periodic Table After School Regents Review Practice

Base your answers to questions **19** through **22** on the information below and on your knowledge of chemistry.

The radius of a lithium atom is 130 picometers, and the radius of a fluorine atom is 60 picometers. The radius of a lithium ion, Li^+ , is 59 picometers, and the radius of a fluoride ion, F^- , is 133 picometers.

- Describe the general trend in atomic radius as each element in Period 2 is considered in order from left to right.
- In the space provided, draw a Lewis electron-dot diagram for a fluoride ion.
- Explain, in terms of subatomic particles, why the radius of a lithium ion is smaller than the radius of a lithium atom.
- Compare the radius of a fluoride ion to the radius of a fluorine atom.

23. The arrangement of the elements from left to right in Period 4 on the Periodic Table is based on

- A) atomic mass
- B) atomic number**
- C) the number of electron shells
- D) the number of oxidation states

24. Which list of elements consists of a metal, a metalloid, and a nonmetal?

- A) Li, Na, Rb
- B) Cr, Mo, W
- C) Sn, Si, C**
- D) O, S, Te



25. Which property can be defined as the ability of a substance to be hammered into thin sheets?

- A) conductivity
 - B) malleability**
 - C) melting point
 - D) solubility
-

The Atom/Periodic Table After School Regents Review Practice

26. The chart below shows the crystal shapes and melting points of two forms of solid phosphorus.

Two Forms of Phosphorus

Form of Phosphorus	Crystal Shape	Melting Point (°C)
white	cubic 	44
black	orthorhombic 	610

Which phrase describes the two forms of phosphorus?

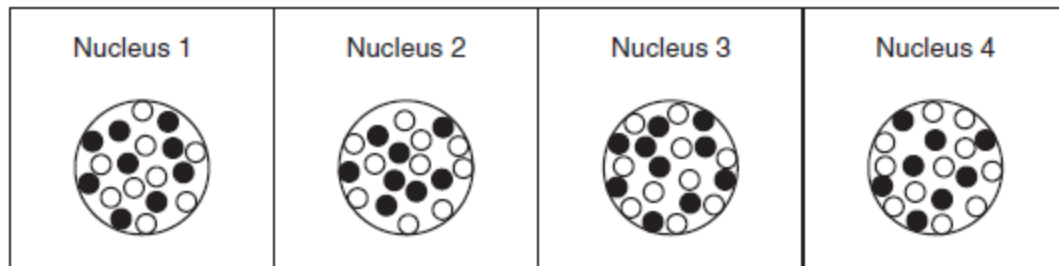
- A) same crystal structure and same properties
B) same crystal structure and different properties
C) different crystal structure and different properties
D) different crystal structure and same properties
-
27. Which element has both metallic and nonmetallic properties?
A) Rb B) Rn **C) Si** D) Sr
28. Which Lewis electron-dot diagram represents a nitrogen atom in the ground state?
A) $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{N}}}$ B) $\cdot\overset{\cdot}{\underset{\cdot}{\text{N}}}\cdot$
C) $\cdot\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{N}}}\cdot$ D) $\cdot\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{N}}}\cdot$
29. An atom of which element has the strongest attraction for the electrons in a bond?
A) aluminum B) carbon
C) chlorine D) lithium
30. Which atom in the ground state requires the *least amount of energy to remove its valence electron*?
A) lithium atom B) potassium atom
C) rubidium atom D) sodium atom
31. Which substance can *not* be broken down by a chemical change?
A) ammonia B) ethanol
C) tungsten D) water

The Atom/Periodic Table After School Regents Review Practice

Base your answers to questions 32 through 35 on the information below and on your knowledge of chemistry.

The diagrams below represent four different atomic nuclei.

Four Atomic Nuclei



Key
● = proton
○ = neutron

- Identify the nucleus above that is found in an atom that has a stable valence electron configuration.
- Explain why nucleus 2 and nucleus 4 represent the nuclei of two different isotopes of the same element.
- Determine the mass number of the nuclide represented by nucleus 2.
- Identify the element that has atomic nuclei represented by nucleus 1.

-
- Base your answer to the following question on the information below and on your knowledge of chemistry.

There are six elements in Group 14 on the Periodic Table. One of these elements has the symbol Uuq, which is a temporary, systematic symbol. This element is now known as flerovium.

State the expected number of valence electrons in an atom of the element flerovium in the ground state.
