

Exercises (10-11-12)

1. Light is incident on the surface of a metal for which the work function is 2 eV.
 - A. What is the minimum frequency the light can have and cause the emission of electron?
 - B. If the frequency of the incident light is 6×10^{14} Hz, what is the maximum kinetic energy of the electron in eV?

2. In a photoelectric effect experiment at a frequency above a cut-off, the number of electrons ejected is proportional to:
 - A. The number of photons that hit the sample.
 - B. The work function.
 - C. Their kinetic energy.
 - D. The frequency of the incident light.

3. Light is incident on the surface of a metal for which the work function is 1.5 eV. The minimum frequency the light can have and cause the emission of electrons is:
A. 4.8×10^{14} Hz B. 2.4×10^{14} Hz C. 5.2×10^{15} Hz D. 3.6×10^{14} Hz

4. Light is incident on the surface of a metal for which the work function is 2 eV. If the frequency of the incident light is 5.2×10^{14} Hz, the maximum kinetic energy of the electron in eV is:
A. 1.5 eV B. 1.2 eV C. 0.15 eV D. 1.6 eV

5. Of the following, Compton scattering from electrons is most easily observed for:
A. microwaves. B. Infrared light. C. X rays. D. Ultraviolet light

6. Almost the entire mass of an atom is concentrated in the
A. proton B. electrons C. nucleus D. neutrons

7. Electrons were discovered by
A. Chadwick B. Thomson. C. Goldstein D. Bohr

8. An atom has a mass number of 23 and atomic number 11. The number of protons and neutrons are

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|-------|-------|-------|-------|
| A. 11 | B. 12 | C. 22 | D. 44 |
| A. 11 | B. 12 | C. 23 | D. 44 |
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9. The mass of the atom is determined by

- | | |
|-------------|-------------------------|
| A.neutrons. | B.neutron and proton. |
| C.electron. | D.electron and neutron. |
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10.Uranium-235, uranium-238, and uranium-239 are different

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|--------------|----------|--------------|--------------|
| A. elements. | B. ions. | C. isotopes. | D. nucleons. |
|--------------|----------|--------------|--------------|
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11.The energy of an electron at the energy level $n=2$ of a hydrogen atom, where $R_H = 2.179 \times 10^{-18} \text{ J}$, is calculated as

- A. $-2.179 \times 10^{-18} \text{ J}$ B. $-1.089 \times 10^{-18} \text{ J}$ C. $-0.544 \times 10^{-18} \text{ J}$ D. $4.352 \times 10^{-18} \text{ J}$
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12. The energy must be absorbed to move an electron from level 1 to level 3 is

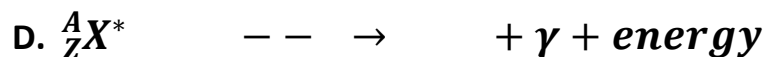
- A. $-1.94 \times 10^{-18} \text{ J}$ B. $+1.94 \times 10^{-18} \text{ J}$ C. $+1.45 \times 10^{-18} \text{ J}$ D. $-4.35 \times 10^{-18} \text{ J}$
-

13.The energy emitted by an atom when an electron moves from level 4 to level 2 is

- A. $-4.09 \times 10^{-19} \text{ J}$ B. $+4.09 \times 10^{-19} \text{ J}$ C. $+1.45 \times 10^{-18} \text{ J}$ D. $-4.35 \times 10^{-18} \text{ J}$
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14.Complete the decay equation:





15. The half life of a specific element was calculated to be 5000 years.

Calculate the decay constant.

- A. 1/ year B. 1.39×10^{-4} / year C. 1.5 / year D. 2500/year

16. Rank the Radioactive Decay from the highest penetrating power to the lowest, β , α , γ .

17. Pd-100 has a half-life of 3.6 days. If one had 6.02×10^{23} atoms at the start.

A. What is the decay constant ?

B. How many atoms would be present after the half -life?

18. The shorter the half-life of a substance means

A. faster disintegration.

B. higher activity.

C. slower disintegration

D. A and B

19. Unstable atomic nucleus loses energy by emitting radiation in the form of particles or electromagnetic waves results in

A. new atom. B. mstable element. C. isotope. D. all are correct

20. Compare between fission and fusion:

	Fission	Fusion
Definition		
Where is it used		
Advantages		
Disadvantages		

21. Number of radioactive nuclei-----with time

**A. decrease exponentially
B. increase exponentially
C. does not change
D. constant**

**22. Activity of nuclide measured the -----and its unit is-----,
and the half-life of a radioactive material measured the -----and its
unit is-----.**

A. (the radioactive decay rate, year B.(the disintegration rate, Becquerel)