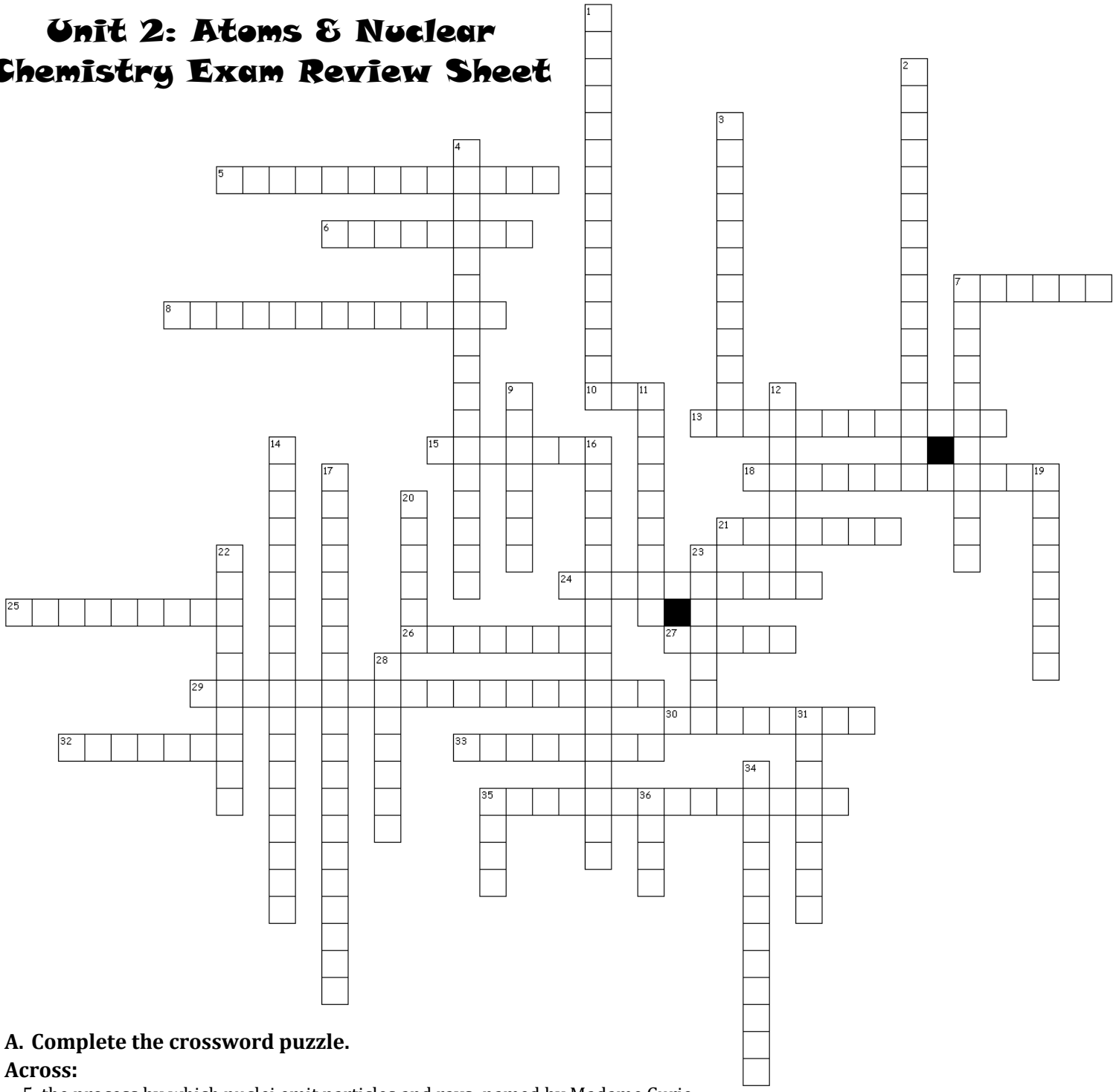
Name: _____ Date: _____Mod:_____ Exam Date : _____

Unit 2: Atoms & Nuclear Chemistry Exam Review Sheet



A. Complete the crossword puzzle.

Across:

5. the process by which nuclei emit particles and rays; named by Madame Curie
6. negatively charged subatomic particle found in the electron cloud surrounding the nucleus of an atom
7. the combining of smaller atoms into larger atoms releasing large amounts of energy; occurs at very high temperatures; this process takes place in the stars (including the sun)
8. radioactivity occurs in isotopes with unstable nuclides also known as _____
10. unit that measures nuclear radiation exposure to humans
13. an electron emitted from the nucleus during some kinds of radioactive decay as a neutron in the nucleus decays
15. the breaking apart of large radioactive atoms into smaller atoms releasing large amounts of energy; this process takes place in nuclear power plants
18. the number of protons in the nucleus of each atom of that element
21. the branch of chemistry dealing with changes in or transformations of the atomic nucleus
24. the total number of protons and neutrons in the nucleus of an isotope
25. high energy electromagnetic waves emitted from a nucleus as it changes from an excited state to a ground energy state
26. refers to both the protons (p^+) and the neutrons (n^0) in the nucleus

27. particle representing a helium nucleus (with two protons and two neutrons bound together) and is emitted from the nucleus during some kinds of radioactive decay; the most massive type of radiation
29. the mass of only one specific isotope
30. atoms of the same element that have a different mass due to different numbers of neutrons
32. refers to the nucleus of a specific isotope
33. the time required for half the atoms of a radioactive nuclide to decay
35. exactly 1/12 the mass of a carbon-12 atom

Down:

1. 6.02×10^{23} representative particles
2. particles or electromagnetic radiation emitted from the nucleus during radioactive decay
3. protons close to one another attract each other due to _____
4. the weighted average of the atomic masses of the naturally occurring isotopes of an element
7. the mass of one single atom expressed in atomic mass units (amu)
9. the first radioactive element on the periodic table
11. the mass of one mole of a pure substance with units of g/mol
12. the ___ theory of matter states that all matter is composed of tiny, invisible, and indivisible particles called atoms
14. protons repel each other in the nucleus due to _____
16. determined by the ratio of protons to neutrons in the nuclide for an isotope
17. the mass defect is converted into _____ and is released when a nucleus is formed from nucleons
19. unit that measures nuclear radiation exposure to the environment
20. positively charged subatomic particle found in the nucleus of atoms
22. the difference between the mass of an atom and the sum of the masses of its protons, neutrons, and electrons
23. small, dense, positively charged center of an atom
28. neutrally charged subatomic particle found in the nucleus of atoms
31. a particle that has the same mass as an electron but has a positive charge, and is emitted from the nucleus during some kinds of radioactive decay
34. the spontaneous disintegration of a nucleus into a slightly lighter nucleus; accompanied by emission of particles, electromagnetic radiation, or both
35. the smallest particle of an element that retains the chemical properties of that element
36. the SI base unit for amount of substance (quantity)

B. Complete each of the following:

1. Found the proton _____
2. Found the electron _____
3. Found the neutron _____
4. Found the nucleus _____
5. Proposed the particle theory of matter _____
6. Gave first proof of the atomic theory _____
7. Confirmed the negative charge of electrons _____
8. Avogadro's constant (#) _____

D. Complete the following table:

Element	Chemical Symbol	Atomic #	Mass #	# protons	# electrons	# neutrons
Calcium						
Nickel						
Silver						
Mercury						
Selenium						

E. Define each on loose-leaf:

1. Law of Conservation of Mass
2. Law of Definite Proportions
3. Law of Multiple Proportions
4. 5 parts of the Atomic Theory

F. Complete the following on loose-leaf. Show your work!

1. How many moles are in 25.4 grams of gold?
2. What is the mass of 3.50 moles of bromine?
3. How many atoms are in 9.7 moles of barium?
4. How many moles are in 8.23×10^{23} atoms of lead?
5. How many atoms are in 6.28 grams of potassium?
6. What is the mass of 6.3×10^{24} atoms of silver?
7. How much of a 250. gram sample of Au-198 is left after 16.20 days if the half-life is 2.70 days?
8. ${}^{4}_{2}\mathrm{He} + {}^{9}_{4}\mathrm{Be} \rightarrow {}^{12}_{6}\mathrm{C} + $_____
9. ${}^{210}_{82}\mathrm{Pb} \rightarrow {}^{210}_{83}\mathrm{Bi} + $_____
10. ${}^{235}_{92}\mathrm{U} \rightarrow {}^{231}_{90}\mathrm{Th} + $_____
11. ${}^{63}_{29}\mathrm{Cu} + {}^{1}_{1}\mathrm{H} \rightarrow {}^{4}_{2}\alpha + $_____