

Date: _____

Name: _____

Modern Atomic Theory

1. Why did Rutherford's discovery of the atomic nucleus cause Thomson's "plum pudding" model of the atom to be abandoned?

2. According to Rutherford's model of the atom, what existed in the nucleus of the atom?

3. Early chemists believed that atoms were indivisible and had no internal structure. What effect did the work of Thomson have on such ideas?

4. How did the work of Dalton allow an expansion of chemical manufacturing?

5. How many protons are in the nucleus of each of the following?
 - a) Be
 - b) U
 - c) Mn

6. How many electrons are there in a neutral atom of each of the following?
 - a) C
 - b) Fe
 - c) Ar

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7. How many electrons are there in each of the following?

- | | |
|---------------------|---------------------|
| a) Na^+ | f) Al^{3+} |
| b) Mg^{2+} | g) Sb^{3-} |
| c) V^{3+} | h) Fe^{2+} |
| d) O^{2-} | i) H^- |
| e) Cl^- | j) As^{3-} |

4. What is the ion produced when

- Two electrons are added to S?
- Two electrons are removed from Ca?
- An electron is added to Cl?
- Three electrons are removed from Al?
- An electron is added to Cr^{3+} ?
- Two electrons are removed from Mn^{2+} ?
- An electron is removed from V^{4+} ?
- Two electrons are added to Sb^- ?
- An electron is removed from O^{2-} ?

5. What is the charge on the nucleus of each of the following?

- | | |
|-------|--------------------|
| a) Mg | c) K^+ |
| b) Ne | d) S^{2-} |

6. Fill in the following table. Show both the atomic number and atomic mass of the “particle”

Particle	Atomic Number	Atomic Mass	Number of Protons	Number of neutrons	Number of electrons
$^{52}_{24}\text{Cr}$					
$^{222}_{86}\text{Rn}$					
	31			39	31
			13	14	13
		197		118	76
		75	33		36
			83	126	78