

Neutral atoms vs. ions (Worksheet 5)

Name \_\_\_\_\_

**main energy level = shell**

1. How many main energy levels are occupied by electrons in a sulfur atom? \_\_\_\_\_
2. How many electrons are in the outermost occupied shell of a sulfur atom? \_\_\_\_\_
3. How many electrons total are in a sulfur atom? \_\_\_\_\_
4. How many electrons total are in a **sulfide ion**? \_\_\_\_\_
5. How many electrons are in the outermost occupied shell of a **sulfide ion**? \_\_\_\_\_
6. How many electrons total are in a neutral calcium atom? \_\_\_\_\_
7. How many valence electrons are in a neutral calcium atom? \_\_\_\_\_
8. How many electrons total are in a calcium **ion**? \_\_\_\_\_
9. How many valence electrons are in a calcium **ion**? \_\_\_\_\_
10. How many main energy levels are occupied by electrons in a calcium **ion**? \_\_\_\_\_

Fill in the chart

Element	# of shells occupied by electrons in a <b>neutral atom</b>	# of valence electrons	Total # of electrons in a <b>neutral atom</b>	Total # of electrons in an <b>ion</b> of this element	<b>Ion symbol</b>	# of shells occupied by electrons in the <b>ion</b> of this element	# of electrons in the outermost occupied shell of the <b>ion</b>
Sr	5	2	38	36	Sr <sup>2+</sup>	4	8
Br							
K							
Cl							
Mg							
F							
Li							
I							
Ba							
Zn							

11. Give the electron configuration for a **neutral** atom of zinc.  $1s^2 2s^2 \dots$

12. Give the electron configuration for a zinc **ion**.

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Neutral atoms vs. ions (Worksheet 5)

Name Key

**main energy level = shell**

1. How many main energy levels are occupied by electrons in a sulfur atom? 3
2. How many electrons are in the outermost occupied shell of a sulfur atom? 6
3. How many electrons total are in a sulfur atom? 16
4. How many electrons total are in a **sulfide ion**? 18
5. How many electrons are in the outermost occupied shell of a **sulfide ion**? 8
6. How many electrons total are in a neutral calcium atom? 20
7. How many valence electrons are in a neutral calcium atom? 2
8. How many electrons total are in a calcium **ion**? 18
9. How many valence electrons are in a calcium **ion**? 8
10. How many main energy levels are occupied by electrons in a calcium **ion**? 3

Fill in the chart

Element	# of shells occupied by electrons in a <b>neutral</b> atom	# of valence electrons	Total # of electrons in a <b>neutral</b> atom	Total # of electrons in an <b>ion</b> of this element	<b>Ion</b> symbol	# of shells occupied by electrons in the <b>ion</b> of this element	# of electrons in the outermost occupied shell of the <b>ion</b>
Sr	5	2	38	36	Sr <sup>2+</sup>	4	8
Br	4	7	35	36	Br <sup>-</sup>	4	8
K	4	1	19	18	K <sup>+</sup>	<del>4</del> 3	8
Cl	3	7	17	18	Cl <sup>-</sup>	3	8
Mg	3	2	12	10	Mg <sup>2+</sup>	2	8
F	2	7	9	10	F <sup>-</sup>	2	8
Li	2	1	3	2	Li <sup>+</sup>	1	2
I	5	7	53	54	I <sup>-</sup>	5	8
Ba	6	2	56	54	Ba <sup>2+</sup>	5	8
Zn	4	2	30	28	Zn <sup>2+</sup>	3	18

11. Give the electron configuration for a **neutral** atom of zinc. 1s<sup>2</sup> 2s<sup>2</sup>...

1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>6</sup> 3d<sup>10</sup> 4s<sup>2</sup>

12. Give the electron configuration for a zinc **ion**.

1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>6</sup> 3d<sup>10</sup>