**Date**

 **Period**

**0216 – Practice**

**Atomic Notation**

 **Name**

**Fill in all of the empty boxes**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **isotope name** | **atomic notation** | **atomic number** | **mass number** | **number of protons** | **number of neutrons** | **number of electrons** |
| **hydrogen-1** | $\begin{matrix}1\\1\end{matrix}$**H** | **1** | **1** | **1** | **0** | **1** |
| **hydrogen-2** | $\begin{matrix}2\\1\end{matrix}$**H** | **1** | **2** | **1** | **1** | **1** |
| **hydrogen-3** | $\begin{matrix}3\\1\end{matrix}$**H** | **1** | **3** | **1** | **2** | **1** |
| **nitrogen-14** | $\begin{matrix}14\\7\end{matrix}$**N** | **7** | **14** | **7** | **7** | **7** |
|  | $\begin{matrix}15\\7\end{matrix}$**N** | **7** | **15** | **7** | **8** | **7** |
|  | $\begin{matrix}15\\7\end{matrix}$**N**$\begin{matrix}-2\\x\end{matrix}$ | **7** | **15** | **7** | **8** | **9** |
|  | $\begin{matrix}15\\7\end{matrix}$**N**$\begin{matrix}-3\\x\end{matrix}$ | **7** | **15** | **7** | **8** | **10** |
|  | $\begin{matrix}16\\8\end{matrix}$**O** | **8** | **16** | **8** | **8** | **8** |
|  | $\begin{matrix}18\\8\end{matrix}$**O**$\begin{matrix}-2\\x\end{matrix}$ | **8** | **16** | **8** | **10** | **10** |
|  | $\begin{matrix}7\\3\end{matrix}$**Li**$\begin{matrix}+1\\x\end{matrix}$ | **3** | **7** | **3** | **4** | **2** |
| **helium-3** | $\begin{matrix}3\\2\end{matrix}$**He** | **2** | **3** | **2** | **1** | **2** |
| **helium-4** | $\begin{matrix}4\\2\end{matrix}$**He** | **2** | **4** | **2** | **2** | **2** |
| **fluorine-19** | $\begin{matrix}19\\9\end{matrix}$**F** | **9** | **19** | **9** | **10** | **9** |
| **sulfur-33** | $\begin{matrix}33\\16\end{matrix}$**S** | **16** | **33** | **16** | **17** | **16** |
| **sulfur-34** | $\begin{matrix}34\\16\end{matrix}$**S** | **16** | **34** | **16** | **18** | **16** |
| **carbon-14** | $\begin{matrix}14\\6\end{matrix}$**C** | **6** | **14** | **6** | **8** | **6** |
|  | $\begin{matrix}35\\17\end{matrix}$**Cl**$\begin{matrix}-1\\x\end{matrix}$ | **17** | **35** | **17** | **18** | **18** |
|  | $\begin{matrix}63\\29\end{matrix}$**Cu**$\begin{matrix}+2\\x\end{matrix}$ | **29** | **63** | **29** | **34** | **27** |
| **uranium-238** | $\begin{matrix}238\\92\end{matrix}$**U** | **92** | **238** | **92** | **146** | **92** |

Atomic Notation – Steps of Process

*Write the atomic symbol, atomic number, mass number, number of protons, neutrons and electrons and write the atom in atomic notation*

 Calcium-43

|  |  |
| --- | --- |
| **Example** | **Step** |
| **Ca** | * Find the element & atomic symbol on the periodic table
 |
| **20** | * Find the atomic number on the periodic table
 |
| **43** | * Find the mass number in name (calcium-43, 43 is mass number)
* It is NOT the same as the atomic weight on the periodic table
 |
| **Np = 20** | * **Np** = atomic number
 |
| **Nn = 43 – 20 = 23** | * **Nn** = mass number - **Np**
 |
| **Ne = 20 – (0)** | * **Ne** = **Np** – (charge)
* If no charge is given in question, there is no charge
* During calculations, put charge in parentheses to avoid mistakes in sign
 |
| $\begin{matrix}43\\20\end{matrix}$**Ca** | * Write in atomic notation

$\begin{matrix} mass \#\\atomic \#\end{matrix}$**atomic symbol** |

If the question is asked about an atom already in atomic notation, the atomic symbol, atomic number and mass number can be read directly from the atomic notation.

*Write the atomic symbol, atomic number, mass number, charge and write the atom in atomic notation*

 protons (p) = 16

 neutrons (n) = 20

 electrons (e) = 18

|  |  |
| --- | --- |
| **Example** | **Step** |
| **Sulfur, S** | * Find the element & atomic symbol on the periodic table
 |
| **atomic #**  **= p**  **= 16** | * Atomic number = number of protons
 |
|  **mass #**  **= p + n**  **= 16 + 20** **= 36** | * Mass number = number of protons + number of neutrons
 |
|  **charge**  **= p – e**  **= 16 – 18** **= – 2** | * Charge = number of protons – number of electrons
 |
| $\begin{matrix}36\\16\end{matrix}$**S**$\begin{matrix}-2\\x\end{matrix}$ | * Write in atomic notation

$\begin{matrix} mass \#\\atomic \#\end{matrix}$**atomic symbol**$ \begin{matrix}charge\\x\end{matrix}$ |

**Atomic Notation Worksheet (Answers)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **isotope name** | **atomic notation** | **atomic number** | **mass number** | **number of protons** | **number of neutrons** | **number of electrons** |
| **hydrogen-1** | $\begin{matrix}1\\1\end{matrix}$**H** | **1** | **1** | **1** | **0** | **1** |
| **hydrogen-2** | $\begin{matrix}2\\1\end{matrix}$**H** | **1** | **2** | **1** | **1** | **1** |
| **hydrogen-3** | $\begin{matrix}3\\1\end{matrix}$**H** | **1** | **3** | **1** | **2** | **1** |
| **nitrogen-14** | $\begin{matrix}14\\7\end{matrix}$**N** | **7** | **14** | **7** | **7** | **7** |
| **nitrogen-15** | $\begin{matrix}15\\7\end{matrix}$**N** | **7** | **15** | **7** | **8** | **7** |
| **nitrogen-15****dianion** | $\begin{matrix}15\\7\end{matrix}$**N**$\begin{matrix}-2\\x\end{matrix}$ | **7** | **15** | **7** | **8** | **9** |
| **nitrogen-15****trianion** | $\begin{matrix}15\\7\end{matrix}$**N**$\begin{matrix}-3\\x\end{matrix}$ | **7** | **15** | **7** | **8** | **10** |
| **oxygen-16** | $\begin{matrix}16\\8\end{matrix}$**O** | **8** | **16** | **8** | **8** | **8** |
| **oxygen-18****dianion** | $\begin{matrix}18\\8\end{matrix}$**O**$\begin{matrix}-2\\x\end{matrix}$ | **8** | **18** | **8** | **10** | **10** |
| **lithium-7****cation** | $\begin{matrix}7\\3\end{matrix}$**Li**$\begin{matrix}+1\\x\end{matrix}$ | **3** | **7** | **3** | **4** | **2** |
| **helium-3** | $\begin{matrix}3\\2\end{matrix}$**He** | **2** | **3** | **2** | **1** | **2** |
| **helium-4** | $\begin{matrix}4\\2\end{matrix}$**He** | **2** | **4** | **2** | **2** | **2** |
| **fluorine-19** | $\begin{matrix}19\\9\end{matrix}$**F** | **9** | **19** | **9** | **10** | **9** |
| **sulfur-33** | $\begin{matrix}33\\16\end{matrix}$**S** | **16** | **33** | **16** | **17** | **16** |
| **sulfur-34** | $\begin{matrix}34\\16\end{matrix}$**S** | **16** | **34** | **16** | **18** | **16** |
| **carbon-14** | $\begin{matrix}14\\6\end{matrix}$**C** | **6** | **14** | **6** | **8** | **6** |
| **chlorine-35 anion** | $\begin{matrix}35\\17\end{matrix}$**Cl**$\begin{matrix}-1\\x\end{matrix}$ | **17** | **35** | **17** | **18** | **18** |
| **copper-63 dication** | $\begin{matrix}63\\29\end{matrix}$**Cu**$\begin{matrix}+2\\x\end{matrix}$ | **29** | **63** | **29** | **34** | **27** |
| **uranium-238** | $\begin{matrix}238\\92\end{matrix}$**U** | **92** | **238** | **92** | **146** | **92** |