Complete this worksheet using the video, “Build An Atom” simulation by clicking on:

<http://screencast-o-matic.com/watch/cbeoFE6BFI>



1. Build the following neutral atom: 1H1. It should look like this when you are done:



Determine the number of subatomic particles:

p+ =

n0 =

e- =

2. Build the following neutral atom: 2He4. It should look like this when you are done:

Determine the number of subatomic particles:

p+ =

n0 =

e- =



3. Build the first three neutral atoms & write the number of subatomic particles for all listed:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 3Li7 | 6C12 | 10Ne20 | 13Al27 | 15P31 | 19K39 |
| # p+ |  |  |  |  |  |  |
| # n0 |  |  |  |  |  |  |
| # e- |  |  |  |  |  |  |

4. Use the video to help you create the nuclear symbol for the first three elements based on the subatomic particles given. Then, write the nuclear symbol of all the atoms:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |   |  |  |  |  |
| # p+ | 4 | 5 | 9 | 12 | 17 |
| # n0 | 5 | 6 | 10 | 12 | 18 |
| # e- | 4 | 5 | 9 | 12 | 17 |

5. Use the video to build the first four atoms. Then, give the atomic number and atomic mass all of the atoms in the chart?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1H1 | 1H2 | 10Ne20 | 10Ne22 | 15P31 | 19K39 |
| Atomic number |  |  |  |  |  |  |
| Atomic mass |  |  |  |  |  |  |

Conclusions

1. What subatomic particle(s) is used to determine atomic number?

2. What subatomic particle(s) is used to determine atomic mass?

3. What makes an atom “neutral”?

4. What is the mass of each subatomic particle?

5. What is an isotope? How does this affect atomic number and atomic mass?

6. Give an example of an isotope.

ANSWER KEY



1. Build the following neutral atom: 1H1. It should look like this when you are done:



Determine the number of subatomic particles:

p+ = 1

n0 = 0

e- = 1

2. Build the following neutral atom: 2He4. It should look like this when you are done:

Determine the number of subatomic particles:

p+ = 2

n0 = 2

e- = 2



3. Build the first three neutral atoms & write the number of subatomic particles for all listed:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 3Li7 | 6C12 | 10Ne20 | 13Al27 | 15P31 | 19K39 |
| # p+ | 3 | 6 | 10 | 13 | 15 | 19 |
| # n0 | 4 | 6 | 10 | 14 | 16 | 20 |
| # e- | 3 | 6 | 10 | 13 | 15 | 19 |

4. Use the video to help you create the nuclear symbol for the first three elements based on the subatomic particles given. Then, write the nuclear symbol of all the atoms:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 4Be9 | 5B11 | 9F19 | 12Mg24 | 17Cl35 |
| # p+ | 4 | 5 | 9 | 12 | 17 |
| # n0 | 5 | 6 | 10 | 12 | 18 |
| # e- | 4 | 5 | 9 | 12 | 17 |

5. Use the video to build the first four atoms. Then, give the atomic number and atomic mass all of the atoms in the chart?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1H1 | 1H2 | 10Ne20 | 10Ne22 | 15P31 | 19K39 |
| Atomic number | 1 | 1 | 10 | 10 | 15 | 19 |
| Atomic mass | 1 | 2 | 20 | 22 | 31 | 39 |

Conclusions

1. What subatomic particle(s) is used to determine atomic number? **protons**

2. What subatomic particle(s) is used to determine atomic mass? **Protons & neutrons**

3. What makes an atom “neutral”?

 **it has the same number of protons and electrons so the negative and positive charges cancel out.**

4. What is the mass of each subatomic particle? **p = 1 amu n = 1 amu e- = 0 amu**

5. What is an isotope? How does this affect atomic number and atomic mass?

 **Isotopes are atoms of the same element, but containing different numbers of neutrons (so the atomic mass is different, but the atomic number is the same).**

6. Give an example of an isotope. **1H1 & 1H2 and 10Ne20 & 10Ne22**