|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Element | Element Symbol | Number of Protons | Number of Neutrons | Number of Electrons | Mass Number  | Atomic Number | Symbol w/ AN and MN |
| Sodium | Na | 11 | 12 | 11 | 23 | 11 |  $$ |
| Calcium |  |  | 20 |  |  |  |  |
| Nitrogen |  |  |  |  | 13 |  |  |
| Neon |  |  | 10 |  |  |  |  |
| Oxygen |  |  |  |  | 16 |  | O-2 |
| Copper |  |  |  |  | 64 |  |  |
| Fluorine |  |  | 10 |  |  |  |  |
| Aluminum |  |  |  | 10 | 27 |  |  |

**Objective 2**: Distinguish the uniqueness of atoms in terms of atomic number, mass number, and isotopes.

Part 1: Atom Properties. *Fill in the blanks for the elements listed below.*
Part 2: Isotopes. *Fill in the blanks for the elements listed below. Remember not to change atomic number or number of protons for atoms of the same element!!*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Element | Number of Protons | Number of Neutrons | Number of Electrons | Mass Number | Atomic Number | Symbol w/ AN and MN |
| Carbon-12 | 6 |  | 6 | 12 |  |  |
| Carbon-13 |  | 7 |  |  |  |  |
| Carbon-14 |  | 8 | 6 | 14 |  |  |
| Chlorine-35 | 17 |  | 17 | 35 |  |  |
| Chlorine-37 |  | 20 | 17 |  | 17 |  |
| Argon-36 | 18 | 18 |  |  |  |  |
| Argon-38 |  | 20 |  | 38 | 18 |  |
| Argon-40 | 18 |  | 18 | 40 |  |  |

Atomic Forces Name:
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**Objective 3**: Describe the forces which bind the atom together.

1. Describe the force that keeps the electrons from leaving the atom.
2. Describe the force which keeps the nucleons bound together.
3. If the electromagnetic force is not strong enough to keep electrons in the cloud, what happens as a result?
4. If the strong nuclear force is not strong enough to keep the nucleons together, what happens as a result?