

## Elemental Hype Poster- Overview

Please rename the slides accordingly, with your name(s) and the topic.

By now you should have signed up for an object or topic to research for this project. The goal for this project is to present enough information that justifies the existence of the elements that are present.

### 1) “Deconstruct” the object and research at least FIVE elements (15 pts.):

- These elements must be related to your topic in some way:
  - It makes up one of the parts
  - It shows up in one of the “steps” of manufacturing/production
  - Your object interacts with this for intended use (i.e. cleaners to stains)
- For each element identified, research *why* it’s specifically involved with your topic
  - Unique physical properties and characteristics
  - Unique chemical properties (if appropriate)
  - It is an “upgrade” over other materials

All of this information must be provided in the “Research” slide given, as well as the appropriate references/resources that you used. You do not have to cite these “properly,” just provide the link. These have to be credible resources (sorry, no Wikipedia).

### 2) Display and “hype” all of your findings (15 pts.):

- All of the information must be displayed in poster format (again, the slide is given).
- Information is displayed neatly. No typos.
- A mix of visuals and written material, to make the poster visually appealing.
- You must use the slide provided, but you are allowed to modify it however you see fit.

**Be creative! You are not limited to any form.**

But make sure you include everything you researched onto the poster.

One of you has to make a copy and share it with the others. Grading will be based on the work being split evenly (you get to decide how).

## Research - Content

/10



Did you research all necessary components for this project?

<b>Exceeds Expectat...</b> 10 pts All 5 components of the research are fulfilled, with the research slide completely filled in. Each component is answered in full.	<b>Meets Expectatio...</b> 8 pts All 5 components of the research are fulfilled, with the research slide filled in. Each component is at least partially answered.	<b>Approaches Expec...</b> 5 pts At least 3 components of the research are fulfilled.	<b>Some Expectation...</b> 3 pts At least 1 component of research is fulfilled.	<b>:(</b> 0 pts There is little to no research done.
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## Research - References

/5



Did you research using reputable references?

<b>Meets Expectatio...</b> 5 pts All components of research were found using credible resources (no Wikipedia). Links are provided for each research component.	<b>Approaches Expec...</b> 2 pts Some references are provided. Some links are provided. OR Wikipedia is used at least once.	<b>:(</b> 0 pts No references are cited.
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## Poster - Content

/10



Are all the necessary content clearly visible on the poster?

<b>Exceeds Expectat...</b> 10 pts All required research is presented on the poster. There is a mix of relevant visuals accompanied with the necessary information.	<b>Meets Expectatio...</b> 8 pts The required research is presented on the poster. There are little visuals to accompany the information.	<b>Approaches Expec...</b> 5 pts Some research is presented on the poster. There are no visuals to accompany the information.	<b>Some Expectation...</b> 3 pts The poster looks incomplete. Some research is presented.	<b>:(</b> 0 pts Why is the poster blank?
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## Poster - Presentation

/5



Is the poster easy to understand?

<b>Meets Expectatio...</b> 5 pts Text is easy to read. Visuals are appropriate and are spaced to accommodate for the text. There are little to no typos on the poster.	<b>Some Expectation...</b> 2 pts Some text is readable. Visuals may have unnecessary overlap with other pieces of content. OR There are enough typos that information isn't conveyed properly.	<b>:(</b> 0 pts Why is the poster blank?
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# Elements of a Tree

6 2  
4  
**C**  
Carbon  
12.011

Carbon from carbon dioxide is turned into glucose as plant cells convert them. Carbon molecules are stored in trees through this process. These sugars are then stored in parts of the tree, such as the leaves, and they add on to each other each year; therefore contributing to the growth of the tree.

Nitrogen makes up the nutrients of the tree and can be detected in green tree parts such as the leaves. It is required for completing the life cycle of a tree and is an essential part of life sustaining molecules in a tree and component of essential processes in a tree.

7 2  
5  
**N**  
Nitrogen  
14.007

1 1  
**H**  
Hydrogen  
1.008

Hydrogen is an element that is contained in the dry matter of wood, which does not contain water. Hydrogen is useful as it is one of the substances that produces heat in the process of burning wood and is a more efficient heat producer than carbon.

Calcium is essential for the trees metabolism and for many other processes which helps the growth of the tree. Calcium also helps improve cell wall strength. When there's a deficiency in calcium the leaves or roots might look distorted because of the lack of strength in the cell walls.

20 2  
8 8  
2  
**Ca**  
Calcium  
40.078

8 2  
6  
**O**  
Oxygen  
15.999

In the dry bark of the tree it contains 38%-42% oxygen. Living oxygen is in 65%-75% of the living tree. Since the majority of trees are made of of water that makes oxygen important for trees.

Potassium is a key element that plays a role in the development and structure of a tree. Potassium helps with osmoregulation (maintaining water and salt levels), cell expansion/growth, and activating the enzymes for it to perform respiration and photosynthesis.

19 2  
8 8  
1  
**K**  
Potassium  
39.098

# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Carbon	<p>The mass of a tree is primarily carbon. When making the dry bark of the tree, it contains about 48-50% carbon. In a living tree, carbon makes up 15-18% of it.</p>	<p>Carbon molecules are carbon that is stored in trees through a process that involves plant cells converting the carbon from carbon dioxide into a solid form in sugars (glucose). These sugars are then stored in leaves, stems, branches and roots. Each year as they continue to add on each other, they make themselves bigger in mass.</p>	<p><a href="https://www.canr.msu.edu/news/where_do_trees_get_their_mass_from#:~:text=The%20mass%20of%20a%20tree,atmospheric%20carbon%20dioxide%20and%20water.">https://www.canr.msu.edu/news/where_do_trees_get_their_mass_from#:~:text=The%20mass%20of%20a%20tree,atmospheric%20carbon%20dioxide%20and%20water.</a></p> <p><a href="https://forestlearning.edu.au/images/resources/How%20carbon%20is%20stored%20in%20trees%20and%20wood%20products.pdf">https://forestlearning.edu.au/images/resources/How%20carbon%20is%20stored%20in%20trees%20and%20wood%20products.pdf</a></p> <p><a href="https://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=19549&amp;catID=192&amp;AskSiteID=87#:~:text=More%20precisely%3A,%2C%20however%2C%20are%20very%20wet.">https://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=19549&amp;catID=192&amp;AskSiteID=87#:~:text=More%20precisely%3A,%2C%20however%2C%20are%20very%20wet.</a></p>
Hydrogen	<p>Hydrogen is an element that is contained in wood.. When making the dry bark of the tree, it contains 6-7% hydrogen. When making a living tree, it contains 9-10% hydrogen.</p>	<p>About 6% of hydrogen is in the dry matter of wood. The dry matter of wood does not contain water. In addition, hydrogen produces heat in the burning process of wood and is a more efficient heat producer than carbon.</p>	<p><a href="https://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=19549&amp;catID=192&amp;AskSiteID=87">https://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=19549&amp;catID=192&amp;AskSiteID=87</a></p> <p><a href="http://www.bioenergyadvice.com/facts/composition-of-wood/">http://www.bioenergyadvice.com/facts/composition-of-wood/</a></p>

# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Oxygen	Oxygen is one of the main elements in a tree, when making the dry bark of the tree it contains 38%-42% oxygen. When tree are living Oxygen is in 65%-75% of the living tree.	Since living tree's mass can be made up of two-thirds of water and since one of the main factors of H <sub>2</sub> O is water that makes oxygen important for trees.	<a href="https://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=19549&amp;catid=192&amp;AskSiteID=87#:~:text=More%20precisely%3A,sulfur%20in%20very%20small%20percentages.">https://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=19549&amp;catid=192&amp;AskSiteID=87#:~:text=More%20precisely%3A,sulfur%20in%20very%20small%20percentages.</a>
Nitrogen	Nitrogen makes up the nutrients of the tree and can be detected in green tree parts such as the leaves.	Nitrogen is required for completing the life cycle of a tree, it is essential part of life sustaining molecules in a tree, Nitrogen is a component of the essential processes in a tree. nitrogen is found everywhere in the tree in small aspects, it is required for a life cycle, and its components are necessary for the processes in a tree.	<a href="https://www.warnell.uga.edu/sites/default/files/publications/Nitrogen%20%26%20Trees%20Pub%2012-1_0.pdf">https://www.warnell.uga.edu/sites/default/files/publications/Nitrogen%20%26%20Trees%20Pub%2012-1_0.pdf</a>
Potassium	Potassium is a key element that plays a role in the development and structure of a tree. It is also the most abundant element in the tree. Potassium is usually known as being in the soil as fertilizer, but it actually plays many roles inside the tree itself.	Potassium helps with osmoregulation (maintaining water and salt levels), cell expansion/growth, and activating the enzymes for it to perform respiration and photosynthesis. Potassium helps the stomata open and close when necessary like for sunlight (energy), and it helps transports nutrients and waters to maintain healthy levels of them.	<a href="https://academic.oup.com/treephys/article/30/9/1140/1637967">https://academic.oup.com/treephys/article/30/9/1140/1637967</a>  <a href="https://www.greenwaybiotech.com/blogs/gardening-articles/whats-the-function-of-potassium-k-in-plants">https://www.greenwaybiotech.com/blogs/gardening-articles/whats-the-function-of-potassium-k-in-plants</a>

# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Calcium	<p>Calcium is an important element the tree that is constantly being exported out of the tree. Calcium from the soil represents 1/9,000 of the calcium in the tree. Calcium is essential for the trees metabolism and for many other processes which helps the growth of the tree.</p>	<p>Calcium is essential for the trees metabolism and for many other processes which helps the growth of the tree. For example, studies have shown that trees with lower levels of calcium had smaller vessels and seasonal rates of wood increments (the rings within the tree), showing that without calcium the tree has trouble growing healthily. Calcium also helps improve cell and cell wall strength. When there is a deficiency in calcium the leaves or roots might look distorted because of the lack of strength in the cell walls. Calcium also activates enzymes to send signals to coordinate cellular activities.</p>	<p><a href="https://academic.oup.com/treephys/article/30/9/1140/1637967">https://academic.oup.com/treephys/article/30/9/1140/1637967</a></p> <p><a href="https://www.pthorticulture.com/en/training-center/role-of-calcium-in-plant-culture/">https://www.pthorticulture.com/en/training-center/role-of-calcium-in-plant-culture/</a></p>

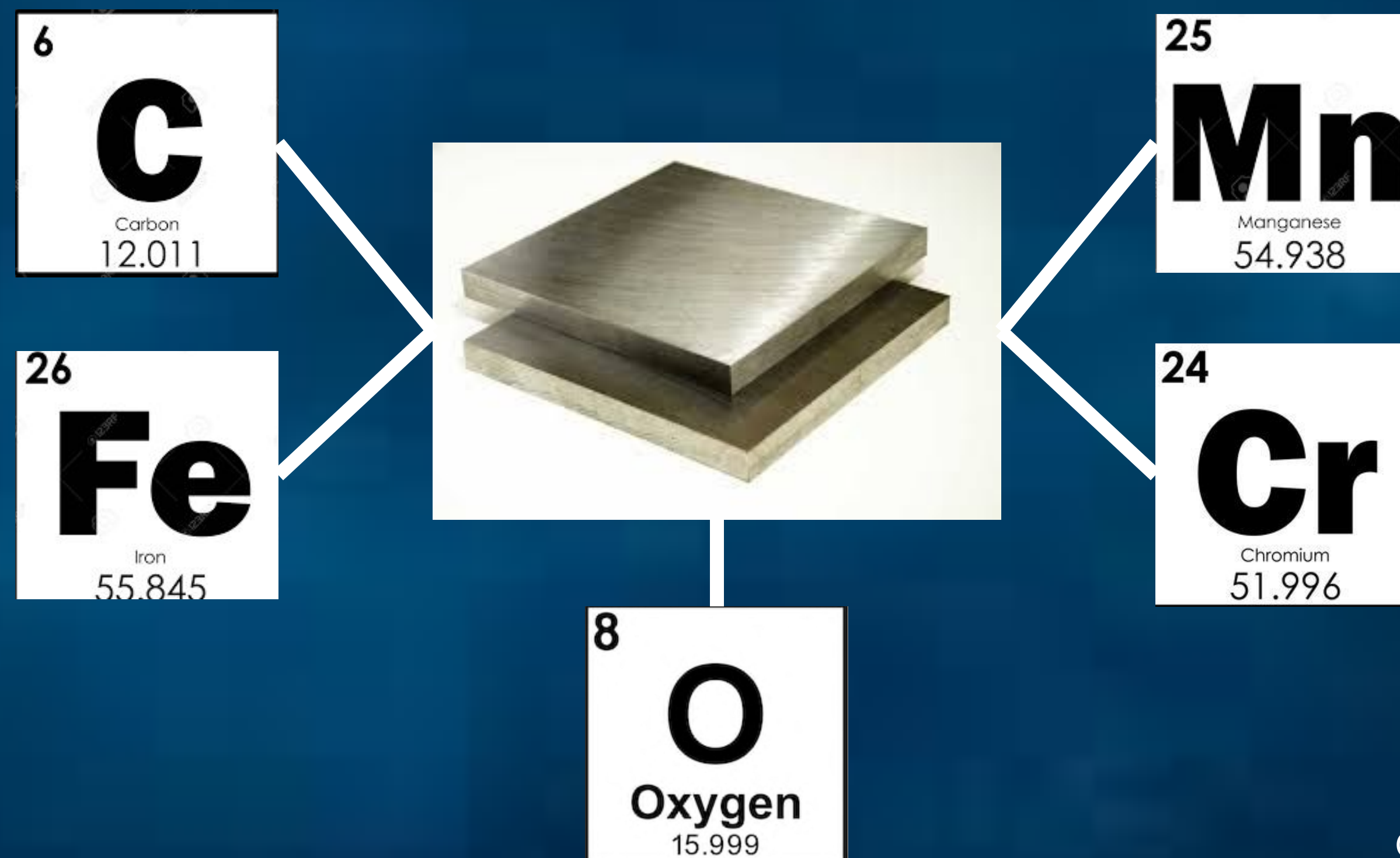


# STEEL

WHEN WE ARE TRYING TO MAKE STEEL, WE ADD CARBON TO MAKE DIFFERNT TYPES OF STEEL. WE CAN MAKE A STEEL PERFECT FOR EACH SUSIATION.

THE TALLEST BUILDING IN THE WORLD, THE BURJ KHALIFA, IS MADE OF STEEL. TOWERING AT 2,716.5 FEET TALL ONE MAY ASK, "HOW DOES IT NOT COLLAPSE?" THE ANSWER IS IN THE DESIGN OF THE BUILDING AND THE MATERIALS USED, THE MAIN ONE BEING STEEL. THE STEEL IS THE PERFECT ALLOY FOR BUILDINGS WITH ALL THE ELEMENTS THAT IT IS MADE OF

Manganese affects the amount of each element that can be put into steel. Manganese removes thinks like oxygen and sulfur from the molten iron.



IRON IS THE MAIN USE OF STEEL. USING IRON, IT WILL MAKE A STRONG MATERIAL WHEN ADDED WITH THE OTHER ELEMENTS.

OXYGEN IS EVERYWHERE AND YOU CAN NOT ESCAPE IT. IT OT USED WHEN CREATING METAL. IT WEEKEANS IT. WHEN THEY MAKE IT, THEY USE A PROCESS TO GET RID OF THE OXYGEN INSIDE OF IT.

BUILDINGS CAN ALSO BE GREATLY WEAKENED WHEN THEY BECOME RUSTY, TO COMBAT THIS THE ELEMENT CHROMIUM IS ADDED IN ORDER TO REDUCE THE CORROSIVENESS OF STEEL THAT IS CAUSED BY OXYGEN.

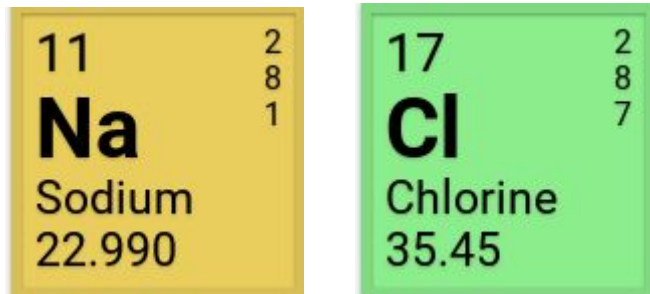


# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Iron	iron makes a much stronger material	It is important because that is the main element to make steel.	<a href="#">iron source</a>
carbon	Carbon can be added to iron to create different types of steel.	Carbon is important to the production of steel because it affects the tensile strength of it. More carbon= higher tensile strength.	<a href="#">Carbon Source</a>
chromium.	A coat of chromium may be added to the alloy in the process of making it.	A coat of chromium can affect the corrosiveness of the alloy. More chromium= less corrosion	<a href="#">Chromium Source</a>
Oxygen	Is always inside steel but is always sought to be removed through various processes	Oxygen can weaken steel and cause oxidation in the metal in to high quantities. The other metals that are added to steel most often will oxidize easily. Oxygen is always present in steels and it weakens the steal.	<a href="https://www.britannica.com/technology/steel/Removing-oxygen">https://www.britannica.com/technology/steel/Removing-oxygen</a>
Manganese	Manganese is used to remove sulfur and Oxygen from raw iron before the carbon is manipulated in the metal.	Very important is limiting oxygen and steel. It will also reduce the brittleness of steel and makes it stronger. It is always added in small quantities	<a href="https://pubs.usgs.gov/fs/2014/3087/pdf/fs2014-3087.pdf">https://pubs.usgs.gov/fs/2014/3087/pdf/fs2014-3087.pdf</a>

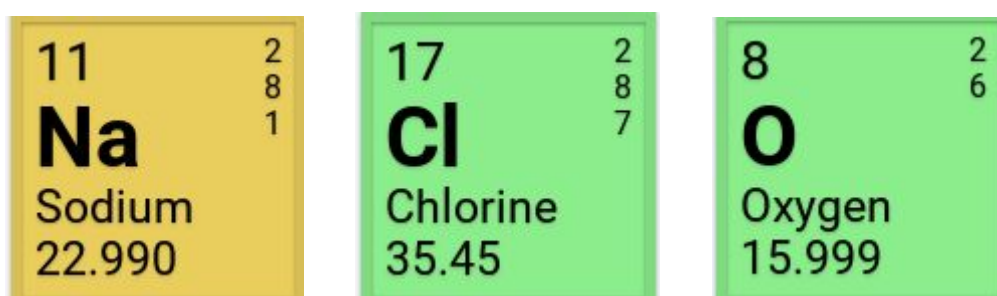


# The Elements of Bleach



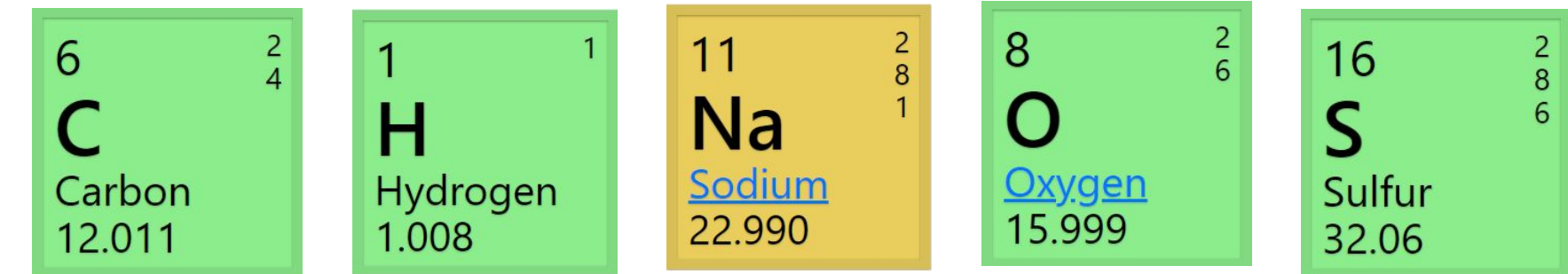
## Sodium Chloride, NaCl

Sodium chloride, better known as your everyday table salt, is often found in cleaning products such as bleach. The use of sodium chlorides in these products is to stabilize and thicken formulas. This compound is found in nearly all products we use on a daily basis, given that salt is something crucial to human life.



## Sodium Chlorate, NaClO<sub>3</sub>

It can be observed that this compound is very similar to Sodium Chloride in chemical makeup, which is true. Sodium Chlorate simply has the addition of three Oxygen molecules. The main use of sodium chlorate in bleach is to actually lighten materials, or to “bleach” it. Household use is only permitted after the mixing with water and other chemicals, since sodium chlorate by itself (and in other mixtures) can be very dangerous.



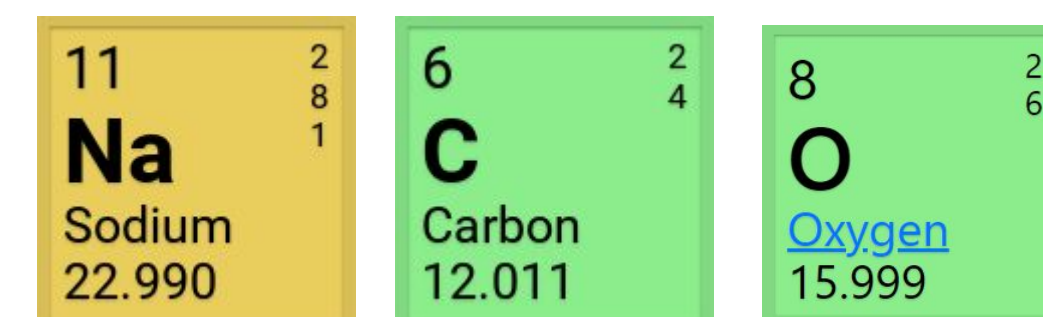
## Sodium Xylene Sulfonate, C<sub>8</sub>H<sub>9</sub>NaO<sub>3</sub>S

Sodium Xylene Sulfonate is used to stabilize the other ingredients and make the formula as effective as possible. The element is important to the product because it helps the product’s effectiveness which is a key selling point.



## PolyDADMAC, (C<sub>8</sub>H<sub>16</sub>NCI)<sub>n</sub>

PolyDADMAC is used as an antistatic agent in bleach. PolyDADMAC is also used as a coagulant in water purification and treatment.



## Sodium Carbonate, Na<sub>2</sub>CO<sub>3</sub>

The purpose of Sodium Carbonate in bleach is to reduce the final bleached brightness to the alkali charge. It’s also said to be one of the most important chemical compounds produced in the United States and is used in other chemicals and household soaps.

# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Sodium Chloride (mel)	Sodium chloride, better known as your everyday table salt, is often found in cleaning products such as bleach. The use of sodium chlorides in these products is to stabilize and thicken formulas.	This compound is found in almost everything that we use on a daily basis. In particular, sodium chloride can be used in cooking and the medical world. Salt is a crucial part of human life, which is why this component is so important.	<a href="https://smartlabel.labelinsight.com/product/6095076/ingredients/sodium-chloride-(cloruro-de-sodio)">https://smartlabel.labelinsight.com/product/6095076/ingredients/sodium-chloride-(cloruro-de-sodio)</a> <a href="https://www.chemicalsafetyfacts.org/sodium-chloride/#safety-information">https://www.chemicalsafetyfacts.org/sodium-chloride/#safety-information</a>
Sodium Chlorate (mel)	The main use of sodium chlorate in bleach is to actually lighten materials, or to “bleach” it. Household use is only permitted after the mixing with water and other chemicals, since sodium chlorate by itself (and in other mixtures) can be very dangerous.	By itself, sodium chlorate is a highly flammable, odorless, pale yellow crystalline substance. It actually has a similar makeup as sodium chloride, just with chlorine added. Other uses of this chemical include bleaching paper, involvement with explosives, and even weed control. All of those are quite dangerous, so this chemical must be used with caution.	<a href="https://pubchem.ncbi.nlm.nih.gov/compound/Sodium-chlorate#section=Uses">https://pubchem.ncbi.nlm.nih.gov/compound/Sodium-chlorate#section=Uses</a> <a href="https://smartlabel.labelinsight.com/product/6095076/ingredients/sodium-chlorate-(clorato-de-sodio)">https://smartlabel.labelinsight.com/product/6095076/ingredients/sodium-chlorate-(clorato-de-sodio)</a>
Sodium Xylene Sulfonate (logan)	Sodium Xylene Sulfonate is used to stabilize the other ingredients and make the formula as effective as possible.	The element is important to the product because it helps the product’s effectiveness which is a key selling point.	<a href="https://smartlabel.labelinsight.com/product/6095076/ingredients/sodium-xylene-sulfonate-(sulfonato-de-xileno-de-sodio)">https://smartlabel.labelinsight.com/product/6095076/ingredients/sodium-xylene-sulfonate-(sulfonato-de-xileno-de-sodio)</a>
Poly diallyl dimethyl ammonium chloride (logan)	PolyDADMAC is used as an antistatic agent in bleach.	PolyDADMAC is also used as a coagulant in water purification and treatment.	<a href="https://smartlabel.labelinsight.com/product/6095076/ingredients/poly(diallyldimethylammonium-chloride)-(poli-(cloruro-de-dialildimetilamonio))">https://smartlabel.labelinsight.com/product/6095076/ingredients/poly(diallyldimethylammonium-chloride)-(poli-(cloruro-de-dialildimetilamonio))</a>
Sodium Carbonate (jacob)	Sodium Carbonate is an alkaline compound with a white appearance that's used in common soaps and glass as well as bleach. It reduces the final bleached brightness to the alkali charge which gives it improved control.	Sodium Carbonate is said to be one of the most important chemical compounds produced in the United States. Alongside bleach, it’s used in other chemicals.	<a href="https://www.encyclopedia.com/science-and-technology/chemistry/compounds-and-elements/sodium-carbonate#:~:text=The%20anhydrous%20form%20of%20sodium,of%20glass%20and%20other%20chemicals.">https://www.encyclopedia.com/science-and-technology/chemistry/compounds-and-elements/sodium-carbonate#:~:text=The%20anhydrous%20form%20of%20sodium,of%20glass%20and%20other%20chemicals.</a>

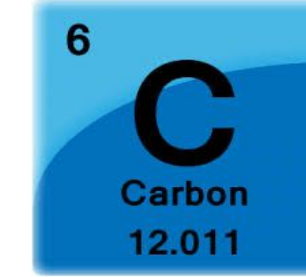
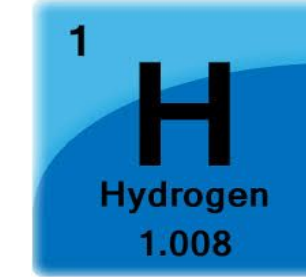
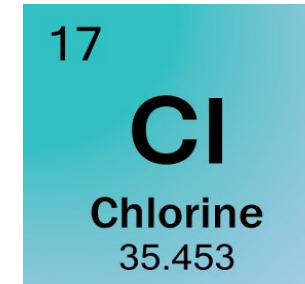
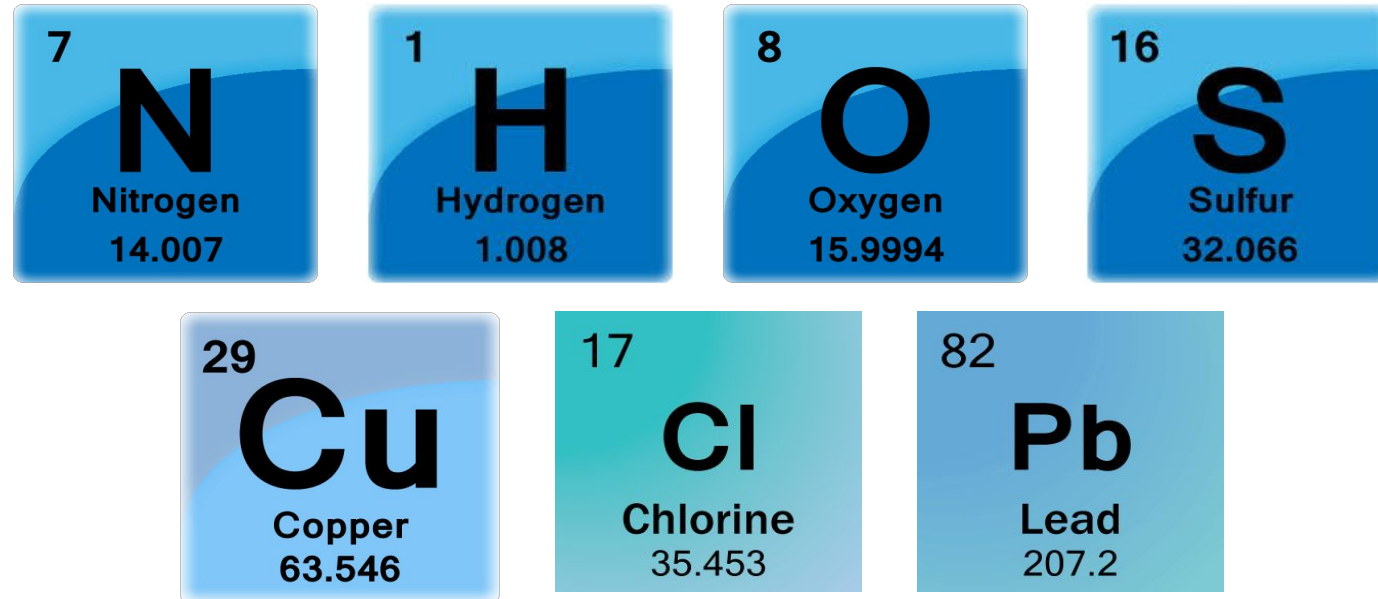


# MOUTHWASH

## HYPE

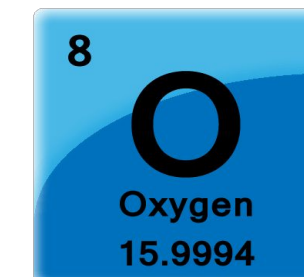
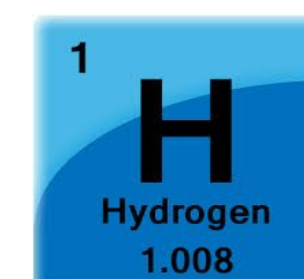
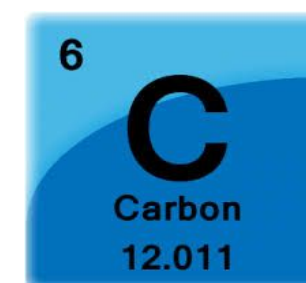
Plastic- Plastic is a mixture of Chlorine, Sulfur, Lead, Copper, Hydrogen, Oxygen, and Nitrogen. It has the most basic use as its molded into a bottle that holds the mouthwash in a controlled area.

Chlorhexidine- is the main part in mouthwash that kills bacteria which is also an antiseptic. The elements in chlorhexidine are Carbon, Hydrogen, Nitrogen, and Chlorine that all make up one of the main ingredients in mouthwash.



Fluoride- Fluoride is the name that is given to a negatively charged Fluorine (F) atom. The Fluoride in mouthwash helps to protect the teeth from harmful acids.

Eucalyptol- is an active ingredient in mouthwash that helps to control airways and it also treats minor mouth and throat inflammation. Eucalyptol has Carbon, Hydrogen, and Oxygen.



# Research

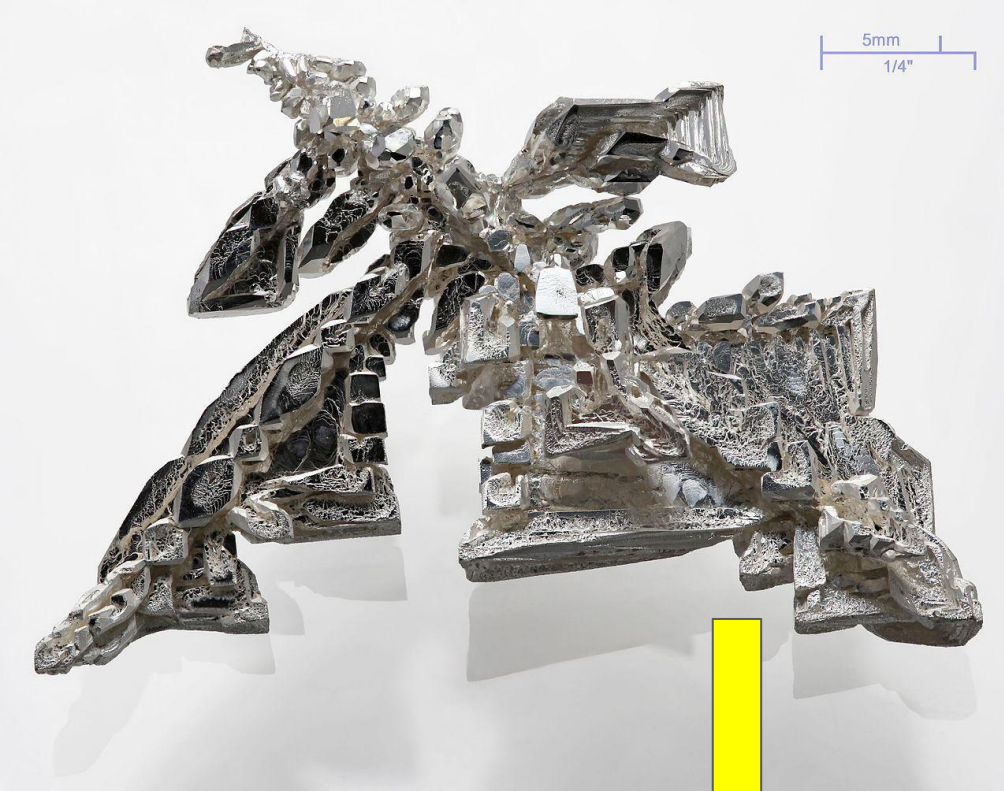
Element	Relation to Object/Topic	Importance of Element	Reference(s)
Oxygen	Oxygen makes up Eucalyptol in mouthwash which is a main ingredient. It also helps make the plastic that is used to hold the mouthwash in the bottle.	Oxygen's main importance in mouthwash is that it is a main ingredient in Eucalyptol so without oxygen Eucalyptol wouldn't be as effective because it wouldn't be the same.	<a href="https://go.drugbank.com/drugs/DB03852">https://go.drugbank.com/drugs/DB03852</a>
Hydrogen	Hydrogen makes up the ingredients Eucalyptol and Chlorhexidine in mouthwash. It also helps make up the plastic.	Hydrogen is a main ingredient in Chlorhexidine and a small but still important ingredient in Eucalyptol. Without hydrogen Chlorhexidine wouldn't be correctly made up with hydrogen peroxide.	<a href="https://www.webmd.com/drugs/2/drug-4570/hydrogen-peroxide-mucous-membrane/details#:~:text=Hydrogen%20peroxide%20rinse%20is%20a,applied%20to%20the%20affected%20area.">https://www.webmd.com/drugs/2/drug-4570/hydrogen-peroxide-mucous-membrane/details#:~:text=Hydrogen%20peroxide%20rinse%20is%20a,applied%20to%20the%20affected%20area.</a>
Carbon	Carbon makes up the Eucalyptol and Chlorhexidine in mouthwash. It also makes up the plastic that holds the mouthwash in the bottle.	Carbon is used in Eucalyptol, Chlorhexidine, and the plastic in the bottle. It helps the bottle hold its shape and it helps make up Chlorhexidine and Eucalyptol.	<a href="https://pubchem.ncbi.nlm.nih.gov/#query=eucalyptol">https://pubchem.ncbi.nlm.nih.gov/#query=eucalyptol</a>
Sulfur	Sulfur is used to make the plastic container/lid that the mouthwash is stored in.	Sulfur can change its chemical structure from a ring to a long chain. The long chain is what allows it to form things like plastic and rubber, while also using other molecules to bring them together. Sulfur helps mold and form the bottle and lid that holds the mouthwash together.	<a href="https://theconversation.com/plastics-of-the-future-may-be-made-from-sulfur-not-oil-putting-waste-to-good-use-48425#:~:text=Under%20the%20right%20conditions%2C%20initially,molecules%20to%20link%20them%20together.">https://theconversation.com/plastics-of-the-future-may-be-made-from-sulfur-not-oil-putting-waste-to-good-use-48425#:~:text=Under%20the%20right%20conditions%2C%20initially,molecules%20to%20link%20them%20together.</a>
Copper	Copper is a part of what makes up the plastic container/lid for the mouthwash.	Things that are made of copper, or have copper in them, are much easier to mold and shape because of their high thermal conductivity. Just like the mouthwash bottle was easier to shape because of the copper in it.	<a href="https://www.moldmakingtechnology.com/articles/a-review-of-copper-alloys-for-plastic-injection-molding-">https://www.moldmakingtechnology.com/articles/a-review-of-copper-alloys-for-plastic-injection-molding-</a>

# Research continued...

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Nitrogen	Nitrogen is used to make up chlorhexidine which is an active ingredient in mouthwash. It is also used to make the plastic.	Nitrogen is used to make up the ingredient Chlorhexidine which is a main ingredient in mouthwash so without Nitrogen the whole mouthwash wouldn't be the same or as effective.	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3605573/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3605573/</a>
Chlorine	Chlorine is something that is used to make the plastic container/lid that the mouthwash is kept in.	Chlorine is usually attached onto other carbon-to-carbon backbones, thus making things like PVC pipes (polyvinyl chlorine) and clear plastics like the bottle of mouthwash.	<a href="https://plastics.americanchemistry.com/How-Plastics-Are-Made/">https://plastics.americanchemistry.com/How-Plastics-Are-Made/</a>
Lead	Lead is in the plastic that is used to hold the mouthwash all in one spot. It helps make up the container.	The lead in the plastic helps soften the plastic and make it more flexible. So the lead in the lid/cap of the bottle is more flexible because of the lead which helps when taking the lid off to use the mouthwash.	<a href="https://www.cdc.gov/nceh/lead/prevention/sources/consumer-products.htm#:~:text=Lead%20softens%20the%20plastic%20and,between%20the%20lead%20and%20plastics.">https://www.cdc.gov/nceh/lead/prevention/sources/consumer-products.htm#:~:text=Lead%20softens%20the%20plastic%20and,between%20the%20lead%20and%20plastics.</a>
Fluorine	Fluorine makes up the flouride in the mouthwash which is a main ingredient.	Fluorine makes up the ingredient fluoride which is used in mouthwash to protect the teeth from harmful acids and other things so without fluorine our teeth wouldn't be protected.	<a href="https://crest.com/en-us/oral-health/mouthwash/difference-between-non-fluoride-and-fluoride-mouthwash">https://crest.com/en-us/oral-health/mouthwash/difference-between-non-fluoride-and-fluoride-mouthwash</a>





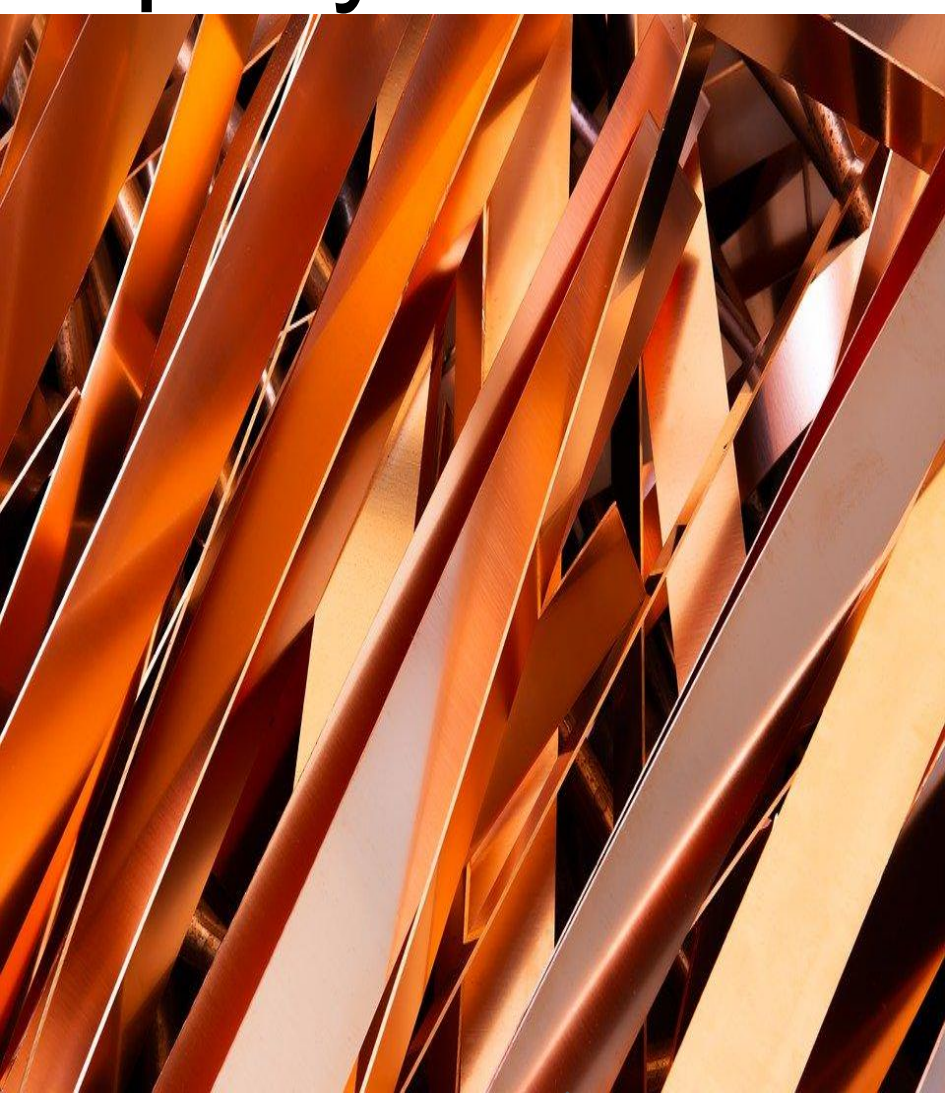


Tungsten relates to a phone charger, as it's commonly used in electronics such as phone chargers as an alloy in order to strengthen the metals.



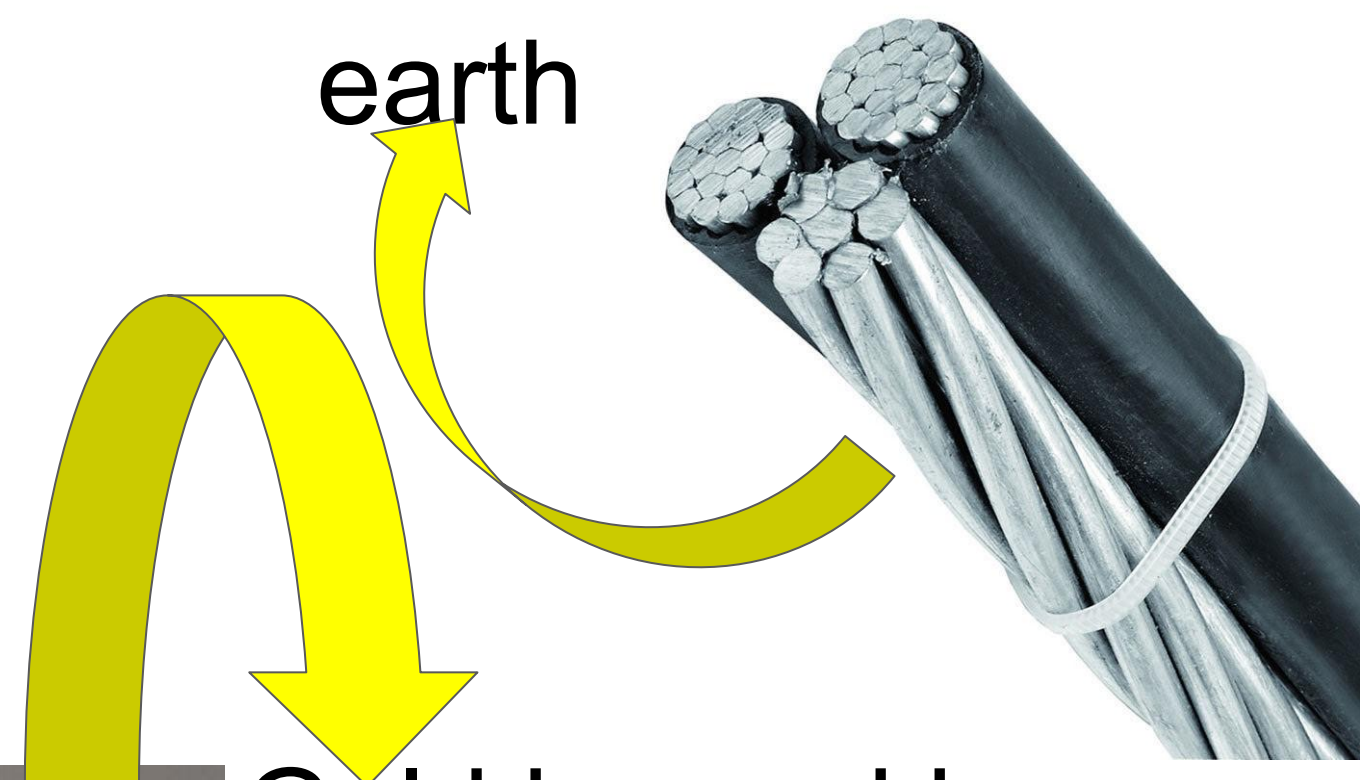
Aluminum relates to our object because it makes up some of the inner part of a charger. It is also the new PVC replacement since it isn't recyclable and is bad for our earth

Silver is used in chargers because they have really strong conduction capabilities to move and use electricity properly.

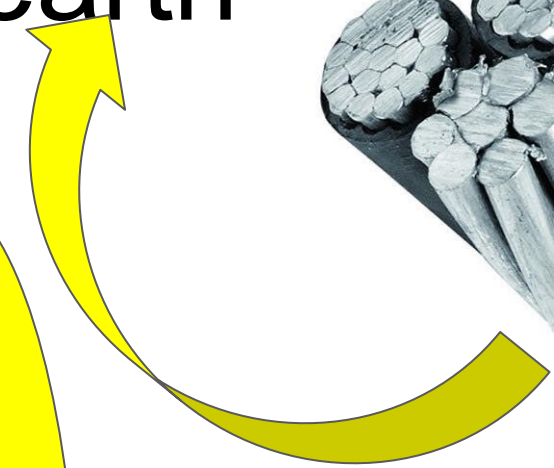
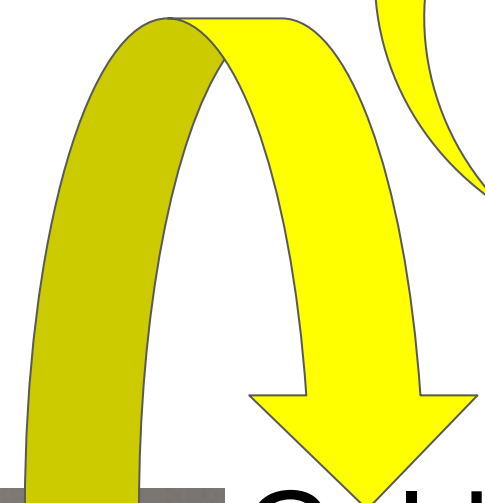
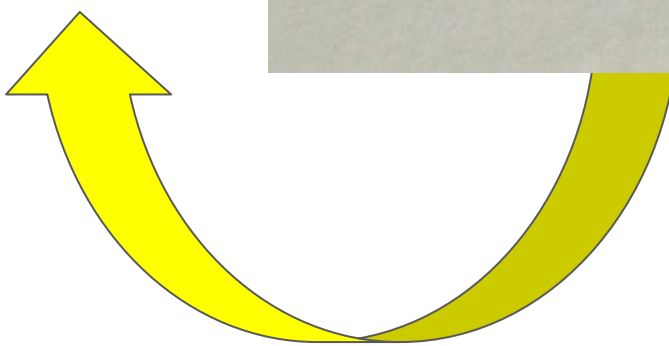
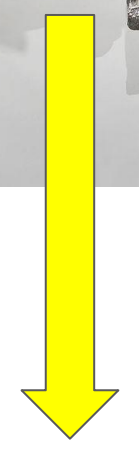
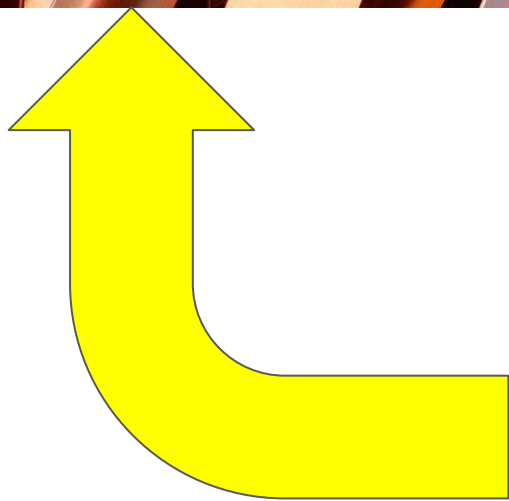


Copper is used in phone chargers because of its superior conductivity. It used to be more common to use mainly Aluminum but after further research copper is now the preferred material in many electronics.

# Phone Charger Components



Gold is used in many electronics including phone chargers because of its reliability. They are used as conductors, connection joint, and connector strips.



# Research (Sage)

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Silver	Silver is used in chargers because they have really strong conduction capabilities to move and use electricity properly.	Silver specifically is a non-toxic metal. Because the metal is safe and non-toxic it is better to use as a conductor than other non safe materials. If the charger where to break, it is not a concern about the elements toxicity.	<a href="https://geology.com/article/s/uses-of-silver/">https://geology.com/article/s/uses-of-silver/</a>
Gold	Gold is used in many electronics including phone chargers because of its reliability. They are used as conductors, connection joint, and connector strips. With the use of gold as connectors you are much less likely to have problems with it because of the reliability.	The element gold is very useful in electronics because they are a sustainable and reliable element. Gold joints and connectors in electronics are often referred in chargers because of the reliability. You are less likely to have problems with it degrading or stopping working with use.	<a href="https://geology.com/">https://geology.com/</a>
Copper	Copper is used in phone chargers because of its superior conductivity. It used to be more common to use mainly Aluminum but after further research copper is now the preferred material in many electronics.	The element copper has very strong conductive capabilities. It is a very safe and non-toxic metal as well. Because of how strong its conductive current is, it is often favored over most other metals. Copper is not just used in chargers either, it is a very versatile conductor and is used in most electronics.	<a href="https://www.copper.org/">https://www.copper.org/</a>

# Research (Taylor and remi)

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Aluminum	<p>This element relates to our object (charger) because it makes up some of the inner part of a charger. It is also the new PVC replacement since it isn't recyclable and is bad for our earth.</p> <p>Aluminum also allows wireless charging; if they had been using metal as an alternative, this wouldn't be an option.</p>	<p>This element is important because it is one of the main components of the inner part of a charger. It is now considered one of the most important components of a charger because it is the new alternative to the PVC. The PVC was bad for the earth so using aluminum is a change for the good.</p>	<p><a href="https://slate.com/technology/2018/09/iphone-android-nimble-chargers-eco-friendly.html">https://slate.com/technology/2018/09/iphone-android-nimble-chargers-eco-friendly.html</a></p>
Tungsten	<p>Tungsten relates to a phone charger, as it's commonly used in electronics such as phone chargers as an alloy in order to strengthen the metals. It can also be seen inside a phone- it's what allows phones to buzz whenever they receive notifications.</p>	<p>Tungsten is important since it provides a massive amount of support to the charger's general durability. While it isn't the most efficient energy-wise, tungsten is extremely strong, ensuring that the charger lasts longer.</p>	<p><a href="https://www.rsc.org/periodic-table/element/74/tungsten#:~:text=Current%20uses%20are%20as%20electrodes,to%20form%20wear%2Dresistant%20coatings.">https://www.rsc.org/periodic-table/element/74/tungsten#:~:text=Current%20uses%20are%20as%20electrodes,to%20form%20wear%2Dresistant%20coatings.</a></p> <p><a href="http://www.tungsten-alloy.com/tungsten-alloy-cell-phone.html#:~:text=Compared%20with%20other%20materials%2C%20the,resistance%2C%20excellent%20thermal%20stability%20and">http://www.tungsten-alloy.com/tungsten-alloy-cell-phone.html#:~:text=Compared%20with%20other%20materials%2C%20the,resistance%2C%20excellent%20thermal%20stability%20and</a></p>



# The Fermentation Process



Sugar ->

<- Yeast

<sup>6</sup> C  
12.001

During the fermentation process, carbon is outputted in the form of bubbles and heat

<sup>19</sup> K  
39.0983

Potassium metabisulfite is added into the yeast in order to prevent the yeast from reproducing too quickly and too much.

<sup>8</sup> O  
15.999

Oxygen is mixed in to make up the sugar molecule, and helps the sugar convert into ethanol and carbon dioxide.

<sup>26</sup> Fe  
55.845

Iron stabilizes the yeast's metabolism and bonds well with the cells in the yeast.

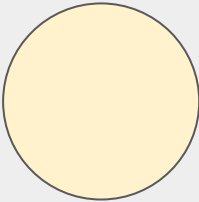
Hydrogen is used to make up the sugar molecule and to bond the final product of ethanol

<sup>1</sup> H  
1.008

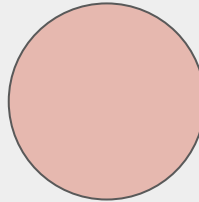
<sup>12</sup> Mg  
24.305

Magnesium plays a huge role in the fermentation process by protecting the yeast cell from environmental stresses, allowing the yeast to live.

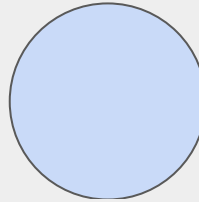
## Element Color Key



Nonmetal



Alkali Metal



Transition Metal

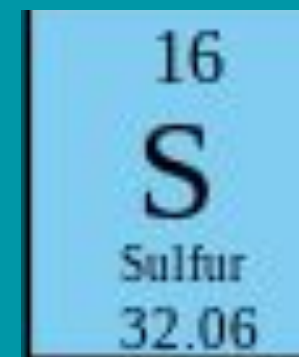
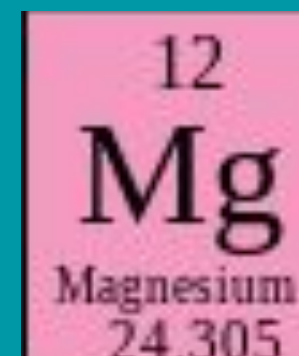
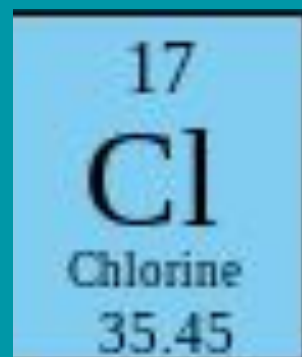
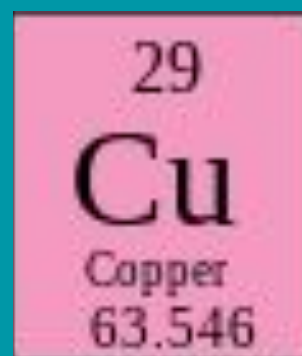
# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
carbon	This element makes up part of the sugar molecule which is one of the most major components of fermentation. It also plays a major part in the output process which I explain in the importance box.	While the fermentation process occurs, carbon is outputted in the form of carbon dioxide (CO <sub>2</sub> ). During the process, CO <sub>2</sub> is being released in the form of bubbles and heat.	1) <a href="http://srjstaff.santarosa.edu/~jhenderson/Chem%20&amp;%20Ferm.pdf">http://srjstaff.santarosa.edu/~jhenderson/Chem%20&amp;%20Ferm.pdf</a> -viticulture and enology (study of wine)class lesson plan from a college class  2) <a href="https://www.texasgateway.org/resource/cell-processes-fermentation">https://www.texasgateway.org/resource/cell-processes-fermentation</a>
oxygen	Oxygen's main purpose in the process of fermentation is to make up part of the sugar molecule. I also has another purpose which I will explain in the importance section	Oxygen has a purpose other than making up the sugar molecule. The oxygen helps the yeast to turn the glucose molecules into ethanol and carbon dioxide. The yeast need oxygen to multiply, in order to continue to ferment.	<a href="http://srjstaff.santarosa.edu/~jhenderson/Chem%20&amp;%20Ferm.pdf">http://srjstaff.santarosa.edu/~jhenderson/Chem%20&amp;%20Ferm.pdf</a> -viticulture and enology (study of wine)class lesson plan from a college class  2) <a href="https://www.thermofisher.co.nz/Uploads/file/Resources/Fermentation-and-Dissolved-Oxygen.pdf">https://www.thermofisher.co.nz/Uploads/file/Resources/Fermentation-and-Dissolved-Oxygen.pdf</a>
hydrogen	Hydrogen acts as the final binding agent for the base of the sugar molecule but it is also actively being produced while fermentation process occurs.	While other molecules are undergoing fermentation, hydrogen has the main job of staying bonded to ethanol in order to produce the final product.	<a href="http://srjstaff.santarosa.edu/~jhenderson/Chem%20&amp;%20Ferm.pdf">http://srjstaff.santarosa.edu/~jhenderson/Chem%20&amp;%20Ferm.pdf</a> -viticulture and enology (study of wine)class lesson plan from a college class  2) <a href="https://www.energy.gov/eere/fuelcells/hydrogen-production-microbial-biomass-conversion#:~:text=In%20fermentation%2Dbased%20systems%2C%20microorganisms.com%20stover%2C%20and%20even%20wastewater.&amp;text=In%20direct%20hydrogen%20fermentation%2C%20the%20microbes%20produce%20the%20hydrogen%20themselves">https://www.energy.gov/eere/fuelcells/hydrogen-production-microbial-biomass-conversion#:~:text=In%20fermentation%2Dbased%20systems%2C%20microorganisms.com%20stover%2C%20and%20even%20wastewater.&amp;text=In%20direct%20hydrogen%20fermentation%2C%20the%20microbes%20produce%20the%20hydrogen%20themselves</a>
Potassium	Potassium acts as an antioxidant and contains anti-microbial properties.	This element acts as a stabilizer in the fermentation process. It doesn't kill newly forming yeast, but it prevents existing yeast from multiplying and getting out of control.	1. <a href="https://yeastextract.info/2014/04/16/natural-yeast-the-nutritious-basis-for-yeast-extract/#:~:text=In%20addition%20to%20high%2Dquality.%2C%20magnesium%2C%20iron%20and%20zinc">https://yeastextract.info/2014/04/16/natural-yeast-the-nutritious-basis-for-yeast-extract/#:~:text=In%20addition%20to%20high%2Dquality.%2C%20magnesium%2C%20iron%20and%20zinc</a>  1. <a href="https://www.google.com/search?q=how+is+potassium+used+in+fermentation&amp;rlz=1CAEZTK_enUS863US863&amp;og=how+is+potassium+used+in+fermentation&amp;aqs=chrome..69i57j69i64.15587j0j4&amp;sourceid=chrome&amp;ie=UTF-8&amp;safe=active&amp;ssui=on">https://www.google.com/search?q=how+is+potassium+used+in+fermentation&amp;rlz=1CAEZTK_enUS863US863&amp;og=how+is+potassium+used+in+fermentation&amp;aqs=chrome..69i57j69i64.15587j0j4&amp;sourceid=chrome&amp;ie=UTF-8&amp;safe=active&amp;ssui=on</a>
Iron	Iron helps stabilize the metabolism of the yeast, allowing the yeast to live and grow.	Yeast consists of iron, as it is an essential micronutrient for the yeast to survive. Iron bonds well with the yeast cells, helping them metabolize better.	1. <a href="https://yeastextract.info/2014/04/16/natural-yeast-the-nutritious-basis-for-yeast-extract/#:~:text=In%20addition%20to%20high%2Dquality.%2C%20magnesium%2C%20iron%20and%20zinc">https://yeastextract.info/2014/04/16/natural-yeast-the-nutritious-basis-for-yeast-extract/#:~:text=In%20addition%20to%20high%2Dquality.%2C%20magnesium%2C%20iron%20and%20zinc</a>  1. <a href="http://www.fao.org/3/x0560e/x0560e08.htm">http://www.fao.org/3/x0560e/x0560e08.htm</a>
Magnesium	Magnesium protects the yeast cells from environmental stresses.	Magnesium ions in the yeast help curtail the yeast's stress response mechanism and help lessen the impact of high stress conditions.	1. <a href="https://yeastextract.info/2014/04/16/natural-yeast-the-nutritious-basis-for-yeast-extract/#:~:text=In%20addition%20to%20high%2Dquality.%2C%20magnesium%2C%20iron%20and%20zinc">https://yeastextract.info/2014/04/16/natural-yeast-the-nutritious-basis-for-yeast-extract/#:~:text=In%20addition%20to%20high%2Dquality.%2C%20magnesium%2C%20iron%20and%20zinc</a>  1. <a href="https://www.researchgate.net/publication/272802093_Role_of_magnesium_ions_on_yeast_performance_during_very_high_gravity_fermentation#:~:text=Magnesium%20is%20a%20key%20cofactor.ethanol%20concentration%20in%20fermenting%20wort">https://www.researchgate.net/publication/272802093_Role_of_magnesium_ions_on_yeast_performance_during_very_high_gravity_fermentation#:~:text=Magnesium%20is%20a%20key%20cofactor.ethanol%20concentration%20in%20fermenting%20wort</a>



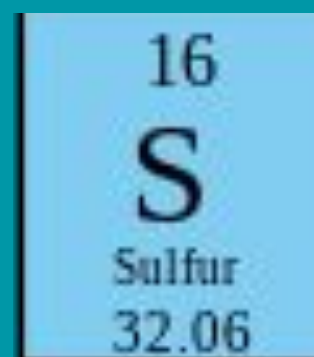
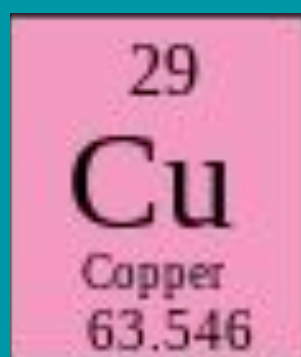
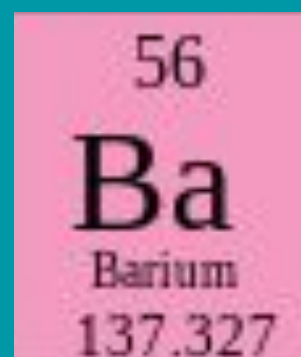
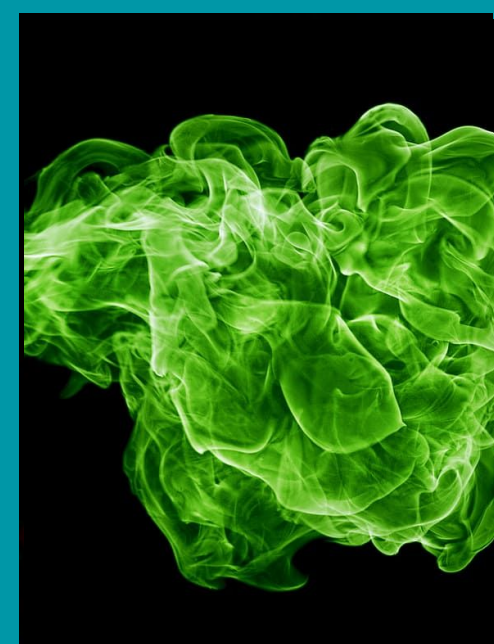


Copper and Chloride combined create an element called Copper Chloride, which when added to a flame changes its color to blue. The reaction that occurred during this process is exothermic because light is being released. The flame glows blue because the temperature is extremely hot and certain gas molecules can change the color to blue.



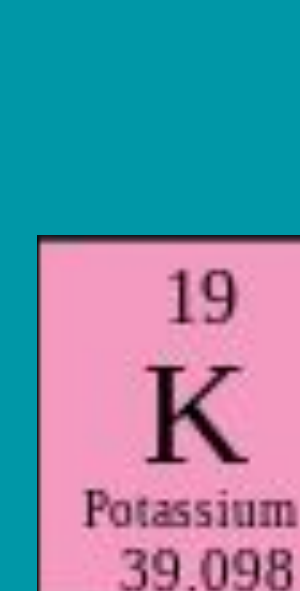
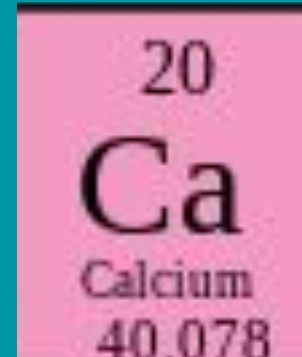
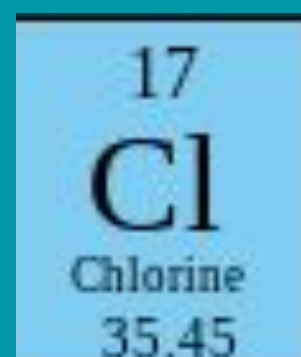
Magnesium and sulfur when combined create an elemental compound called magnesium sulfate. This chemical compound creates a white flame when burned. This is also an exothermic reaction. Flames normally turn white when the temperature of it is between 1400°C and 1700°C and it has to have Magnesium Sulfate somewhere in the fire.

## Color of Fire Elements



The element Boron is used to make the color of a flame green. Pieces of Barium can be sprinkled onto the fuel of a fire to change it to a green color. Other elements that can make a green flame is Copper and Sulfate however the green color they produce is not as prominent.

Calcium and chloride together creates calcium chloride. By sprinkling the compound onto a normal fire, it should intensify the orange hue within the flame due to the temperature rise (1000°F to 2100°F). However, this vibrant orange color will only be produced when there is absolutely no sodium present as the sodium adds a yellow tone making it a different color, which is something that many people don't realize.



When combined, potassium, oxygen, and nitrogen create the element compound potassium nitrate. Potassium nitrate is the compound that makes the flames purple in a fire. When combined with a reducing agent like fire, it releases enough oxygen to create a reaction between the two. Once, the temperature is high enough, the compound burns a purple flame, thus creating purple fire.

# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Copper	Copper is one of the elements that can dictate what the color of fire is.	This is important because it makes the color of the flame to a greenish blue, but mainly blue. It does this because when Copper is burned it emits a greenish blue light. When electrons lose energy the lost energy can be emitted as light. This is also an exothermic reaction because heat and energy is exiting the atoms.	<a href="https://www.scientificamerican.com/article/sizzling-science-exploring-the-chemistry-of-fireworks/#:~:text=This%20is%20because%20when%20the%20metal%20copper%20is%20burned%2C%20it,can%20be%20released%20as%20light.">https://www.scientificamerican.com/article/sizzling-science-exploring-the-chemistry-of-fireworks/#:~:text=This%20is%20because%20when%20the%20metal%20copper%20is%20burned%2C%20it,can%20be%20released%20as%20light.</a>
Magnesium	Magnesium is one element which influences the white hue within a flame.	The color of the fire changes along with the heat that is produced: white fire is the hottest. Magnesium has about half of the initial melting point to make a fire white, which provides most of the heat (2500°F to 2800°F)	<a href="https://sciencenotes.org/how-to-make-white-fire/">https://sciencenotes.org/how-to-make-white-fire/</a>
Barium	Barium is the element that when added to a flame can change its color to green.	This element is important because it can be used to change to color of fire to green. Which can be used for many decorative purposes, like a green fire can be used to create a green firework. It is a soft silvery metal that reacts with water and air, and is commonly found in things like drilling oils and paint.	<a href="https://www.thoughtco.com/make-a-rainbow-of-colored-flames-606193">https://www.thoughtco.com/make-a-rainbow-of-colored-flames-606193</a> <a href="https://www.rsc.org/periodic-table/element/56/barium#:~:text=Barium%20is%20a%20soft%2C%20silvery,air%20and%20reacts%20with%20water.&amp;text=Barium%20is%20not%20an%20extensively,in%20paint%20and%20in%20glassmaking.">https://www.rsc.org/periodic-table/element/56/barium#:~:text=Barium%20is%20a%20soft%2C%20silvery,air%20and%20reacts%20with%20water.&amp;text=Barium%20is%20not%20an%20extensively,in%20paint%20and%20in%20glassmaking.</a>
Potassium	Potassium which is one of the elements that can cause a change in the color of fire. This particular element causes the flames to become purple.	Potassium can become highly explosive when in contact with reducing agents like fire, hence the reason that it is commonly used in fireworks. When combining the reducing agent with the potassium it will produce enough oxygen in order for the reducing agent to react. As the heat increases, the reaction will begin to take place and the flame created will burn purple (1,022 - 1454 °F).	<a href="https://sciencing.com/burn-potassium-nitrate-7708552.html">https://sciencing.com/burn-potassium-nitrate-7708552.html</a>
Calcium	Calcium is one element that gives fire a vibrant orange color.	This element is one of the most common colors seen in everyday flames, like a gas stove top produces an orange flame. Calcium is important because it changes the color of the flame to an orange hue. This flame normally has a temperature of 1000°F to 2200°F.	<a href="https://sciencenotes.org/how-to-make-orange-fire/">https://sciencenotes.org/how-to-make-orange-fire/</a>



# B

## Boron

This is nutrient required for plants. Boron is a fertilizer. It is needed for normal and healthy growth in plants, plus the production of vegetables.

# Fe

## Iron

Eggplant is rich in iron. Iron prevents anemia or iron deficiency by increasing production of red blood cells

# Mn

## Manganese

Manganese is a natural antioxidant in the eggplant. The antioxidant in the eggplant can help with preventing cancer & it can protect your organs.



# K

## Potassium

It is a nutrient that is required by plants. Potassium contributes to the strength of the stem, the resistance of diseases, and growth.

# P

## Phosphorus

It is one of the three primary nutrients. It benefits the formation of new roots

# Ca

## Calcium

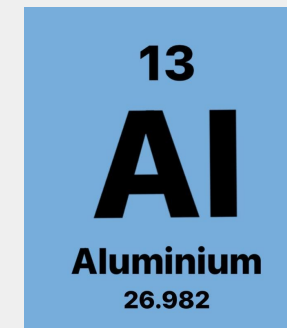
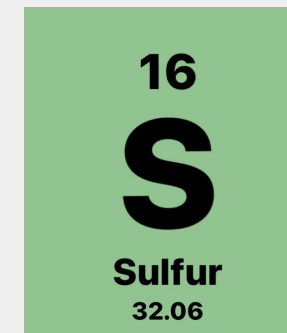
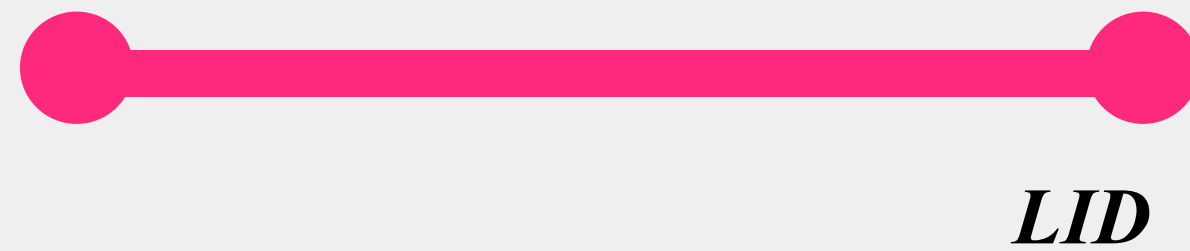
Calcium keeps the plant from rotting. Calcium deficiency is the primary cause of blossom-end rot, so calcium is needed in the eggplant.

# Research

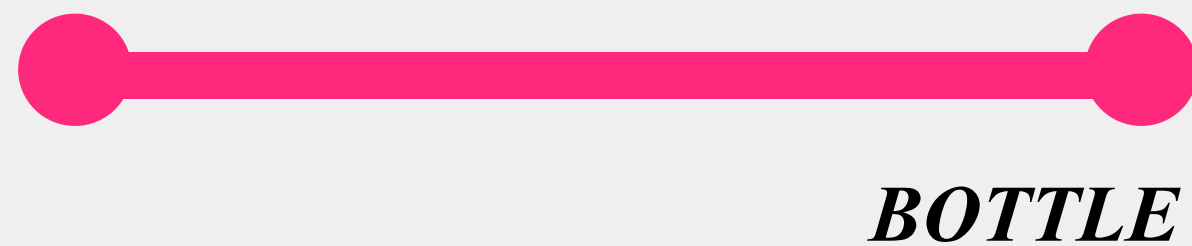
Element	Relation to Object/Topic	Importance of Element	Reference(s)
Boron	-this is nutrient required for plants.	-boron is a fertilizer -this is needed for normal + healthy growth in plants+production of vegetables	<a href="https://healthyliving.azcentral.com/chemical-components-of-eggplant-12492219.html">https://healthyliving.azcentral.com/chemical-components-of-eggplant-12492219.html</a> <a href="http://mtvernon.wsu.edu/path_team/Boron%20in%20schools%20&amp;%20Plant%20Nutrition%20-%20US%20Borax%20publication.pdf">http://mtvernon.wsu.edu/path_team/Boron%20in%20schools%20&amp;%20Plant%20Nutrition%20-%20US%20Borax%20publication.pdf</a>
Potassium	<ul style="list-style-type: none"> <li>It is a nutrient that is required by plants</li> </ul>	<ul style="list-style-type: none"> <li>Potassium contributes to the strength of the stem, the resistance of diseases, and growth</li> </ul>	<a href="https://www.gardeningknowhow.com/edible/vegetables/eggplant/how-to-fertilize-eggplants.htm#:~:text=Potassium%20contributes%20to%20stem%20strength,with%20setting%20and%20producing%20fruit.">https://www.gardeningknowhow.com/edible/vegetables/eggplant/how-to-fertilize-eggplants.htm#:~:text=Potassium%20contributes%20to%20stem%20strength,with%20setting%20and%20producing%20fruit.</a>
iron	-eggplant is rich in iron	-iron prevents anemia/iron deficiency by increasing production of red blood cells	<a href="https://food.ndtv.com/food-drinks/5-amazing-health-benefits-of-eggplant-you-may-have-not-heard-before-1725646">https://food.ndtv.com/food-drinks/5-amazing-health-benefits-of-eggplant-you-may-have-not-heard-before-1725646</a>
Manganese	<ul style="list-style-type: none"> <li>It is a natural antioxidant in the eggplant</li> </ul>	1. The antioxidant in the eggplant can help with no getting cancer & it can protect your organs	<a href="https://www.doublediamondacres.com/2018/02/15/7-surprising-health-benefits-of-eating-eggplant/#:~:text=PREVENTS%20CANCER&amp;text=One%20of%20the%20many%20benefits,that%20your%20organs%20are%20protected.">https://www.doublediamondacres.com/2018/02/15/7-surprising-health-benefits-of-eating-eggplant/#:~:text=PREVENTS%20CANCER&amp;text=One%20of%20the%20many%20benefits,that%20your%20organs%20are%20protected.</a>
Phosphorus	It is one of the three primary nutrients	Benefits the formation of new roots	<a href="https://www.gardeningknowhow.com/edible/vegetables/eggplant/how-to-fertilize-eggplants.htm#:~:text=Phosphorus%20benefits%20the%20formation%20of,with%20setting%20and%20producing%20fruit.">https://www.gardeningknowhow.com/edible/vegetables/eggplant/how-to-fertilize-eggplants.htm#:~:text=Phosphorus%20benefits%20the%20formation%20of,with%20setting%20and%20producing%20fruit.</a>
Calcium	It keeps plants from rotting	1. Calcium deficiency is the	<a href="https://homeguides.sfgate.com/eggplants-like-bone-meal-85429.html#:~:text=Phosphor">https://homeguides.sfgate.com/eggplants-like-bone-meal-85429.html#:~:text=Phosphor</a>



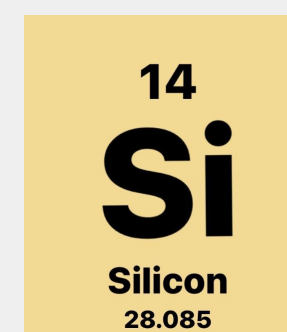
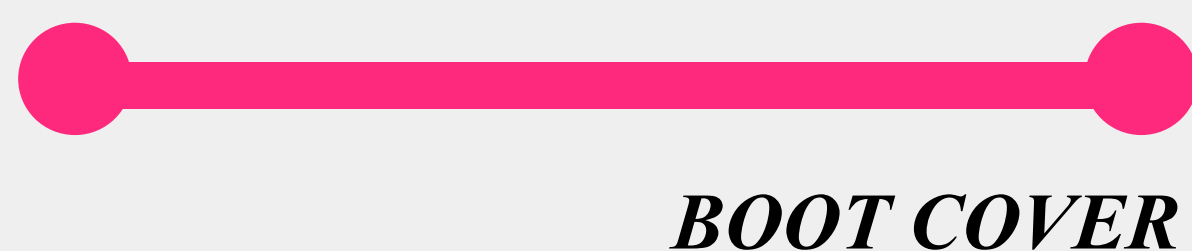
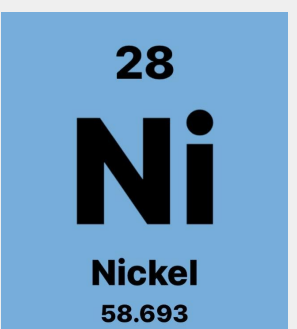
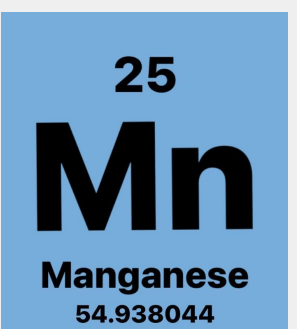
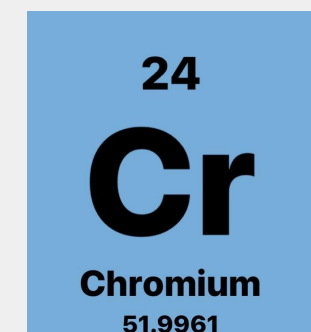
# ELEMENTS OF A HYDRO FLASK



Sulfur and Aluminum are combined together to help create the plastic, yet insulated lid. The sulfur chains are joined together which helps create a solid plastic, while the aluminium (Honeycomb Insulator) makes it lightweight and provides as a good insulation within the lid.



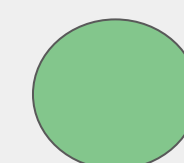
Within the bottle there are elements such as Chromium, Nickel, and Manganese. They are all a part of the manufacturing for the stainless steel, which is the main metal used in the Hydro Flask. Chromium increases resistance and hardens the material to create durability and a long-lasting product. Along with chromium, nickel provides strength, toughens the metal, and especially allows the steel bottle to excel with extremely high and low temperatures. Nickel is specifically fit for the Hydro Flask because it is famously known for having amazing insulation and maintaining temperatures. Lastly, Manganese is used to deoxidize the steel and is a key step in processing the stainless steel because it creates pristine quality. All of these elements are the most fit to provide a durable environment for the Hydro Flask because they have strong properties compared to weak structures, which are perfect for the stainless steel of the bottle.



The silicone boot is an added extra to the Hydro Flask brand and it is sold as a protective item to keep your water bottle free of dents and destruction. When the Hydro Flask becomes dented, the insulation of the bottle weakens because it could damage the vacuum seal. Silicon is the main element that makes up silicone and its specific property makes it so common to be in the silicone substance. When in its silicate form, it is heat resistant, slippery, and even has insulation benefits. Heat resistance is key for being on a Hydro Flask because as it being a thermos, it needs to withstand high temperatures. The nature of silicone molds is for its slippery consistency which is perfect for a bottle boot, so that it is easy to take off and on. An extra benefit of silicon in silicone is that it is used with semiconductors because it has low heat transfer to improve the performance of the Hydro Flask insulation.



metals



metalloids



nonmetals

# Research

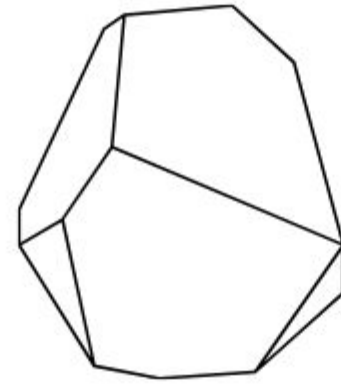
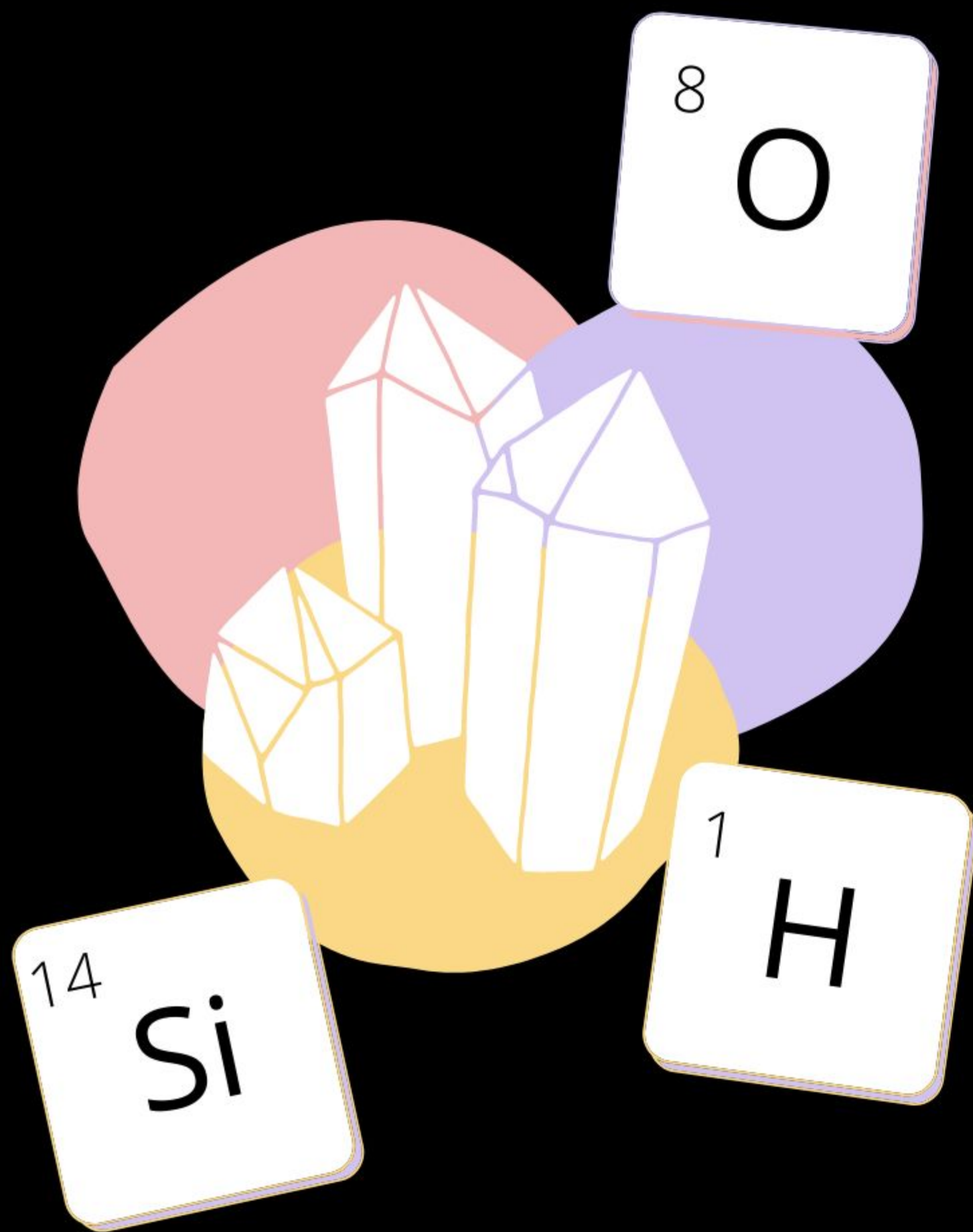
Element	Relation to Object/Topic	Importance of Element	Reference(s)
chromium	Makes up the stainless steel of the bottle.	Chromium is a major influence in the manufacturing of stainless steel, which is the metal of the bottle is made out of. It increases resistance and hardens the material to create durability.	<a href="https://pubs.usgs.gov/fs/2010/3089/pdf/fs2010-3089.pdf">https://pubs.usgs.gov/fs/2010/3089/pdf/fs2010-3089.pdf</a>
nickel	Makes up the stainless steel of the bottle.	Along with chromium in the bottle, nickel is also incorporated and very important with stainless steel. It provides strength, toughens the metal, and especially allows the steel bottle to excel with extremely high/low temperatures.	<a href="http://www.designlife-cycle.com/hydroflask-life-cycle">http://www.designlife-cycle.com/hydroflask-life-cycle</a> <a href="https://www.ssina.com/education/product-resources/alloying-elements/#:~:text=Nickel%20is%20the%20essential%20allying,makes%20the%20material%20non%2Dmagnetic.">https://www.ssina.com/education/product-resources/alloying-elements/#:~:text=Nickel%20is%20the%20essential%20allying,makes%20the%20material%20non%2Dmagnetic.</a>
Manganese	Makes up the stainless steel of the bottle.	Manganese is used for deoxidizing steel	<a href="https://byjus.com/chemistry/manganese/">https://byjus.com/chemistry/manganese/</a>
silicon	Makes up the silicone cover that protects the bottom of the bottle.	Silicon is what the silicone boot is made out of for protection of the bottle. The silicone boot prevents the bottle from getting dented because when the dents reach the vacuum seal, the insulation weakens. Silicon, in its silicate form, is highly heat resistant, slippery for practicality, and is beneficial for the insulation.	<a href="https://www.livescience.com/37598-silicon-or-silicone-chips-implants.html#:~:text=In%20its%20silicate%20form%2C%20the,an%20ideal%20semiconductor%20of%20electricity.&amp;text=Silicone%2C%20by%20contrast%2C%20is%20a,most%20typically%20carbon%20and%20hydrogen.">https://www.livescience.com/37598-silicon-or-silicone-chips-implants.html#:~:text=In%20its%20silicate%20form%2C%20the,an%20ideal%20semiconductor%20of%20electricity.&amp;text=Silicone%2C%20by%20contrast%2C%20is%20a,most%20typically%20carbon%20and%20hydrogen.</a>
sulfur	Found in the plastic lid of bottle.	Helps create a solid plastic when chains of sulfur are joined together	<a href="https://theconversation.com/plastics-of-the-future-may-be-made-from-sulfur-not-oil-putting-waste-to-good-use-48425">https://theconversation.com/plastics-of-the-future-may-be-made-from-sulfur-not-oil-putting-waste-to-good-use-48425</a>
Aluminum	Honeycomb insulation that is found inside the lid.	Makes it lightweight and good heat insulator	<a href="https://www.arrow-dragon.com/10-things-you-need-to-know-about-aluminum-honeycomb-panel/">https://www.arrow-dragon.com/10-things-you-need-to-know-about-aluminum-honeycomb-panel/</a> <a href="https://www.hydroflask.com/standard-mouth-flex-cap">https://www.hydroflask.com/standard-mouth-flex-cap</a>





# The Chemistry of Crystals

(to specify: naturally occurring and pure forms of quartz)



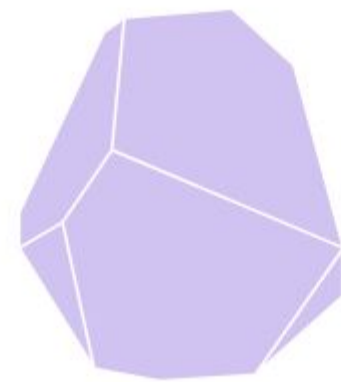
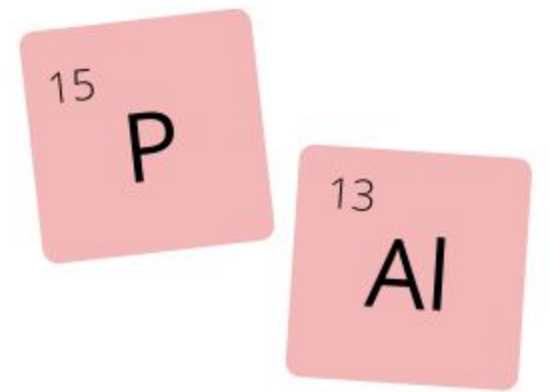
## Clear Quartz - Si+O<sub>2</sub>

Clear quartz is the basis for differently colored quartz, and it is made up of silicon and oxygen (hydrogen is important in the process). Stemming from silica dissolving into water (H<sub>2</sub>O), silica is introduced to Oxygen. From there, the two form together in a covalent bond following a change in temperature or pressure. Overall, this brings the elements together to form the base quartz.



## Rose Quartz - Si+O<sub>2</sub>+P+Al

Due to the trace amounts of phosphorus and aluminum found in rose quartz, it gains its pink color. Through the process of irradiation it produces a pink hue as a result of a reaction between aluminum and phosphate as it gets heated.



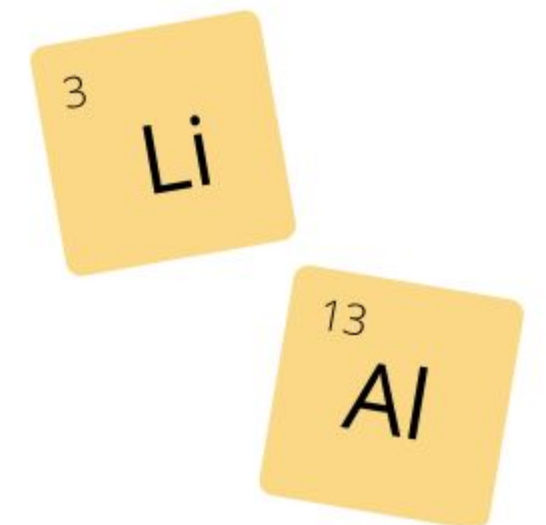
## Amethyst Quartz - Si+O<sub>2</sub>+Fe

During the formation of the quartz, if irradiation of iron occurs with the combination of silica and oxygen, iron becomes part of the crystal mix resulting in the final quartz reflecting a purple color.



## Citrine Quartz - Si+O<sub>2</sub>+Li:2Al

Due to dichroism, when two different light rays pass through the mesh-like structure of the crystal, it allows the crystal to reflect two different colors depending on the angle the light rays hit the crystal. When lithium reacts with aluminum in the crystal, it creates the yellowish, orange color citrine is known for.



# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Silica	<p>Makes up the normal clear quartz</p> <p>Si +O2 = Clear Quartz</p>	<p>When under high pressure and temperature, Silica dissolves in water, and then is formed into a crystal when the temp or pressure drops</p> <p>The elements also form an covalent bond, which is when the elements share electrons, and holds the elements together</p>	<p><a href="https://www.gemsociety.org/article/how-does-quartz-form/#:~:text=In%20igneous%20rocks%2C%20quartz%20forms%20as%20magma%20cools.&amp;text=Quartz%20that%20grows%20from%20silica,saturated%2C%20so%20quartz%20crystals%20form.">https://www.gemsociety.org/article/how-does-quartz-form/#:~:text=In%20igneous%20rocks%2C%20quartz%20forms%20as%20magma%20cools.&amp;text=Quartz%20that%20grows%20from%20silica,saturated%2C%20so%20quartz%20crystals%20form.</a></p>
Oxygen	<p>Comes together with silica, in the formation of base clear quartz.</p> <p>Si +O2 = Clear Quartz</p>	<p>^^^</p> <p>Stemming from silica dissolving into water (H<sub>2</sub>O), Silica is introduced to Oxygen, forming together in a covalent bond, after a change in temperature or pressure, this brings the elements together, to form the base quartz</p>	<p><a href="https://sciencing.com/types-bonding-crystals-6891243.html">https://sciencing.com/types-bonding-crystals-6891243.html</a></p>
Hydrogen	<p>This makes up the water, in which the silica gets dissolved into</p>	<p>Without the water, there would be no crystal as the pressure change allows the dissolved silica to form into a solid figure, quartz</p>	<p><a href="https://www.gemsociety.org/article/how-does-quartz-form/#:~:text=In%20igneous%20rocks%2C%20quartz%20forms%20as%20magma%20cools.&amp;text=Quartz%20that%20grows%20from%20silica,saturated%2C%20so%20quartz%20crystals%20form">https://www.gemsociety.org/article/how-does-quartz-form/#:~:text=In%20igneous%20rocks%2C%20quartz%20forms%20as%20magma%20cools.&amp;text=Quartz%20that%20grows%20from%20silica,saturated%2C%20so%20quartz%20crystals%20form</a></p>

# Important Background Information

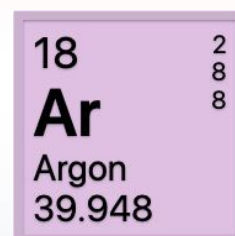
Terms and definition needed to understand said project:

- irradiation: exposure to radiation (such as x-rays or alpha particles ([source](#)))
  - why is this relevant? It is the process in which an element is exposed to the silica dissolved water to the newly introduced element, which changes the color of the quartz - without it the only resulting quartz would be clear
- covalent: (refers to covalent bond) in chemistry, the interatomic linkage that results from the sharing of an electron pair between two atoms... A covalent bond forms when the bonded atoms have a lower total energy than that of widely separated atoms. ([source](#))
- why is this relevant? The covalent bond found between the elements in quartz, form the hexagonal shape of the crystal.
- dichroism: the exhibition of essentially different colors by certain solutions in different degrees of dilution or concentration ([source](#)) OR the property of some crystals and solutions of absorbing one of two plane-polarized components of transmitted light more strongly than the other ([source](#))
  - why is this relevant?
- Pegmatite: a type of igneous rock that is formed underground
- Crystal formations, especially that of quartz are formed in a lattice shape where which allows two wavelengths of light to pass through a crystal in different directions



# Neon Light Signs

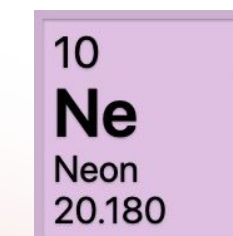
## Argon



Argon creates a light blue color, which is fainter and lighter than the color that neon produces. It is often mixed with mercury to strengthen the color. This gas is plentiful and inexpensive to produce for these signs. It also requires the least amount of energy because it does not require as much electrical input to react compared to other gases. In addition, if you coat the tubes in different phosphors that are ultraviolet-sensitive it can also produce different colors and shades.

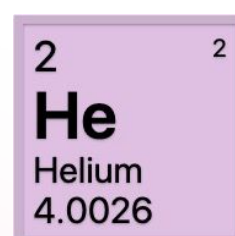
Neon signs are generally used for decoration for homes and businesses. They are an effective piece of decoration because it is captivating and energy efficient. Neon signs can last up to 10 years and can be kept on overnight. These signs can offer a variety of colors, using the elements argon, neon, helium, xenon, and krypton, which are all under group 18 of the periodic table of elements.

## Neon



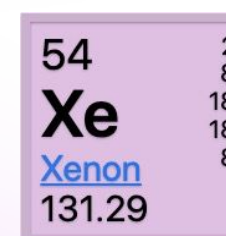
Neon is more commonly used for electric signs and usually only found in red-colored signs. Only small amounts of this gas is required to create the color, a strong red-orange hue. It is also a safe gas since it makes up part of the air in the atmosphere and is an inexpensive gas.

## Helium



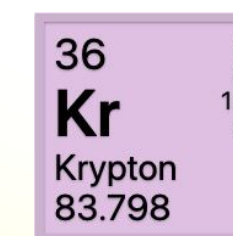
Often use with argon. When helium is used by itself, it creates a pinkish-red glow. Helium is used in its purest form as it is a speciality for lamps that utilize neon and argon. This is what can make the light into an orange color.

## Xenon



Xenon gas is used to produce a hue of light-blue, grey, or a bright lavender color. This gas when not used alone, like helium, would need to be assorted with other noble gases in order to make various colors in the neon light sign.

## Krypton



The color produced by Krypton establishes a yellowish, green, or white colored light. This element is significant as it is used for when the glass is previously colored, the light would come off the gases, brightening the glasses color.

# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Argon	The element contributes to the change in color; Lavender	<p>This color is light and fainter than neon and mixed with the tiniest amount of mercury makes the color stronger . The color made is a light- blue. However, if you coat the tubes in different phosphors that are ultraviolet-sensitive it can also produce different colors and shades.</p> <p>“Argon is the gas that requires the least amount of electrical input to react and thus uses the least energy of all.” Inexpensive, abundant</p>	<p><a href="https://sciencing.com/gases-used-neon-signs-5581339.html">https://sciencing.com/gases-used-neon-signs-5581339.html</a></p> <p><a href="https://www.sygns.com/blogs/magazine/the-sa-ns-of-neon-gas">https://www.sygns.com/blogs/magazine/the-sa-ns-of-neon-gas</a></p>
Helium	The element Helium turn the light into orange	<p>Helium while it is often used with agron when used by itself makes a pinkish-red glow. Helium used in its purest form is a specialty for lamps that use neon and Argon.</p> <p>It is also a rare gas.</p>	<p><a href="https://sciencing.com/gases-used-neon-signs-5581339.html">https://sciencing.com/gases-used-neon-signs-5581339.html</a></p>
Neon	Neon turns color of the red	<p>Neon is the most used gas for electric signs, only a small amount of this gas contributes to the color; the fumes already give off a strong red-orange hue. It is also an inexpensive gas that is commonly used to produce neon signs.</p> <p>Usually only found in classic red colored signs, energy efficient, only small amounts needed, neon is in air you breathe (safe), inexpensive</p>	<p><a href="https://sciencing.com/gases-used-neon-signs-5581339.html">https://sciencing.com/gases-used-neon-signs-5581339.html</a></p>
Xenon	This element changes the color of the to either gray, blue, or even lavender	<p>Xenon gas can be used to produce a hue of light-blue or bright lavender. This gas, is not used alone, like helium it needs to be mixed with other noble gases in order to makes different colors in signs</p>	<p><a href="https://sciencing.com/gases-used-neon-signs-5581339.html">https://sciencing.com/gases-used-neon-signs-5581339.html</a></p>
Krypton	Krypton makes the color yellow, green, or white.	<p>The color produced by Krypton makes a yellowish/ white colored light. This element is important to used when the glass is already colored, as the light that comes off of the gases brightens the glasses color</p>	<p><a href="https://sciencing.com/gases-used-neon-signs-5581339.html">https://sciencing.com/gases-used-neon-signs-5581339.html</a></p>



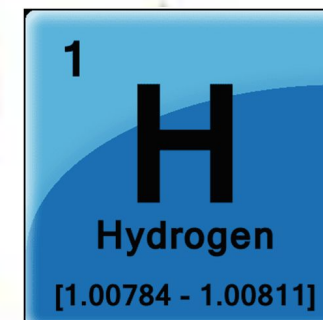


**Iron:** Iron is a mineral found in fruit. Therefore, when you eat fruit you are bringing iron to your body, which regulates your oxygen. Raspberries are high in iron as well as dried fruits such as coconut and apricots. Iron in your body makes hemoglobin, This is a protein in red blood cells that carries oxygen from your lungs to the rest of your body. Iron also creates myoglobin, which brings oxygen to your muscles. Your body needs iron to grow, develop, and survive.

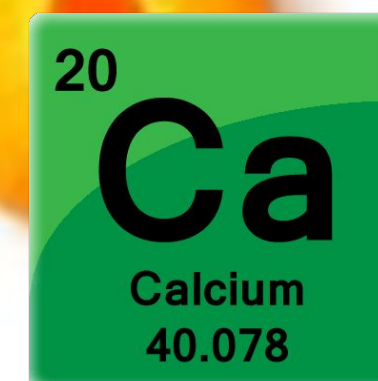
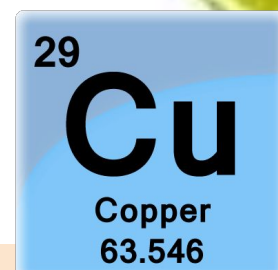
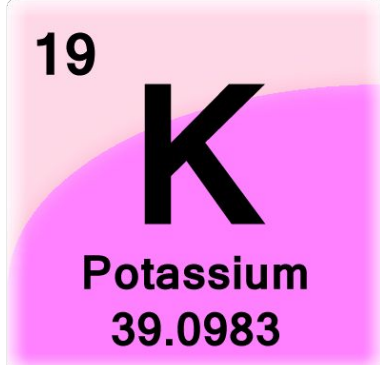


Liana Lent  
Samantha Liao  
Kaitlene Ofilan

**Water:** {Hydrogen 2 oxygen} Water is 80- 90% content of fruits. Fruits like blueberries, apricots, oranges, pineapples, cantaloupe, watermelon have super high percentages of water content. Water plays a role in evolution, reproduction cycle, and physiological process. It affects storage period length and the consumption of tissue reserve substances. Bound water is found in cells, forms true solutions with organic substances, swelling agent for colloidal structure substances. Constitution water is bound to chemical components and hard to remove(dry up)



# Elements of Fruits



**Potassium:** A mineral and electrolyte found in fruits. Many common fruits have potassium such as bananas, avocado, cantaloupe, nectarines, etc. It's good for your body but too much could be dangerous. It helps your blood pressure, controls heartbeat and breathing. Helps nerves function and your muscles work. Potassium is found in your muscles cells, bones, liver and red blood cells.

**Copper:** Copper is a mineral found in fruits. When you eat fruits with copper, it helps your body absorb iron and form red blood cells. Avocadoes, blackberries, and pomegranates are fruits high in copper. Copper in your body, along with iron, helps form red blood cells, maintains bones, and helps prevent high cholesterol and high blood pressure. Copper is known to maintain collagen and elastin, and is hypothesized to prevent skin ageing

**Calcium:** Calcium is a chemical found in fruit. When you eat fruit, the calcium keeps your bones strong. Some fruits high in calcium are oranges, tangerines, kiwis, guavas, and blackberries among many others. Calcium builds bones and keeps them healthy. Itn also keeps our heart beating, enables our muscles to contract, and our blood to clot. 99% of calcium in our bodies is in our bones and teeth.

nt	Relation to Object/Topic	Importance of Element	Reference
m	A mineral and electrolyte found in fruits. Many common fruits have potassium such as bananas, avocado, cantaloupe, nectarines, etc.	It's good for your body but too much could be dangerous. It helps your blood pressure, controls heartbeat and breathing. Helps nerves function and your muscles work. Potassium is found in your muscles cells, bones, liver and red blood cells.	<a href="https://www.kidneyfund.org/kidney-disease-ckd/complications/high-potassium.html#:~:text=Potassium%20and,your%20blood%20by%20y">https://www.kidneyfund.org/kidney-disease-ckd/complications/high-potassium.html#:~:text=Potassium%20and,your%20blood%20by%20y</a> <a href="http://www.fao.org/3/v5030e/V5030e.htm">http://www.fao.org/3/v5030e/V5030e.htm</a>
	Calcium is a chemical found in fruit. When you eat fruit, the calcium keeps your bones strong. Some fruits high in calcium are oranges, tangerines, kiwis, guavas, and blackberries among many others.	Calcium builds bones and keeps them healthy. It also keeps our heart beating, enables our muscles to contract, and our blood to clot. 99% of calcium in our bodies is in our bones and teeth.	<a href="https://www.nof.org/patient-education/calcium-vitamin-d/#:~:text=Calcium%20a%20mineral%20that%20helps%20build%20bones%20and%20teeth">https://www.nof.org/patient-education/calcium-vitamin-d/#:~:text=Calcium%20a%20mineral%20that%20helps%20build%20bones%20and%20teeth</a> <a href="https://www.myfooddata.com/food-facts/gh-calcium-fruits.php">https://www.myfooddata.com/food-facts/gh-calcium-fruits.php</a>
	Iron is a mineral found in fruit. Therefore, when you eat fruit you are bringing iron to your body, which regulates your oxygen. Raspberries are high in iron as well as dried fruits such as coconut and apricots.	Iron in your body makes hemoglobin, This is a protein in red blood cells that carries oxygen from your lungs to the rest of your body. Iron also creates myoglobin, which brings oxygen to your muscles. Your body needs iron to grow, develop, and survive.	<a href="https://ods.od.nih.gov/factsheets/iron/#:~:text=Iron%20is%20a%20mineral%20that,iron%20helps%20make%20some%20hormones">https://ods.od.nih.gov/factsheets/iron/#:~:text=Iron%20is%20a%20mineral%20that,iron%20helps%20make%20some%20hormones</a>
	Copper is a mineral found in fruits. When you eat fruits with copper, it helps your body absorb iron and form red blood cells. Avocadoes, blackberries, and pomegranates are fruits high in copper.	Copper in your body, along with iron, helps form red blood cells, maintains bones, and helps prevent high cholesterol and high blood pressure. Copper is known to maintain collagen and elastin, and is hypothesized to prevent skin ageing	<a href="https://www.myfooddata.com/food-facts/s/high-copper-fruits.php">https://www.myfooddata.com/food-facts/s/high-copper-fruits.php</a> <a href="https://www.medicalnewstoday.com/articles/288165#:~:text=Copper%20is%20an%20essential%20mineral%20for%20cardiovascular%20disease%20and%20osteoporosis%2C%20and%20it%20helps%20prevent%20skin%20ageing">https://www.medicalnewstoday.com/articles/288165#:~:text=Copper%20is%20an%20essential%20mineral%20for%20cardiovascular%20disease%20and%20osteoporosis%2C%20and%20it%20helps%20prevent%20skin%20ageing</a>
(20) en	Water is 80- 90% content of fruits. Fruits like blueberries, apricots, oranges, pineapples, cantaloupe, watermelon have super high percentages of water content.	Water plays a role in evolution, reproduction cycle, and physiological process. It affects storage period length and the consumption of tissue reserve substances. Bound water is found in cells. forms true solutions with organic	<a href="http://www.fao.org/3/v5030e/V5030e.htm#E06">http://www.fao.org/3/v5030e/V5030e.htm#E06</a>

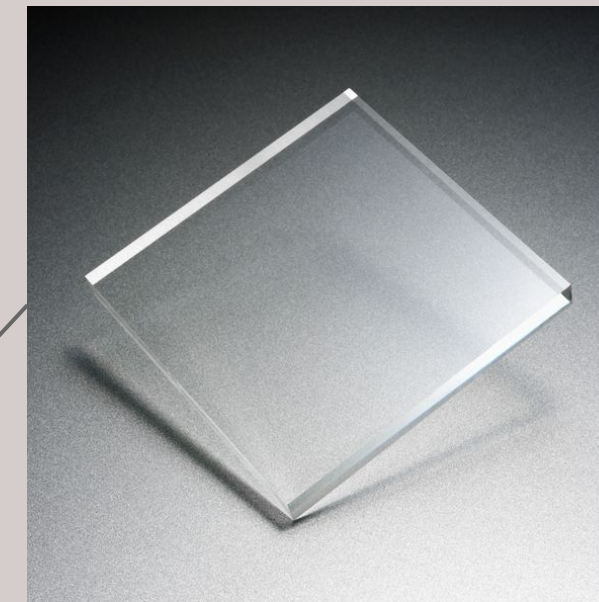


# Elements in Colored Glass



## GOLD

Gold was once used in the process of coloring antique glass. It gives glass its red and pinkish color tones and attributed to its cost. But a red glass panel today costs less, through the use of cheaper materials.



## Silicon

Silicon is a key factor in the creation of stained glass because it is used to create the glass that is stained. The glass can be created using silicon fused together with silicon dioxide or silicon sand. After, the silicon is cooled to create the final glass product.



## Sulfur

Sulfur is also used in the process of coloring glass. Without sulfur you would have to find an alternative and synthetic way to make glass yellow. It can even turn glass black if mixed with carbon and iron salts in the melting process.



## Iron Oxide

Iron Oxide is used to create color on glass. It produces different rich tints of green. Also when combined with other elements it can create a brown color. This element has been used on many antique things and is still used today to create green and brownish bottles.



## LEAD

Lead is used to show the distinct differences between different shapes and colors in stained glass art pieces. It is like a border between the cracks of a window. This element is also used to cool down the process of using different colors to create the desired scene in a stained glass window. Lead is important to display the different parts among this art.



# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
Gold	Gold is used in the process of coloring glass. It is very important, because it is one of the few elements that can make the desired color.	Gold is what gives glass its red and pinkish colors. Which is why antique red glass is so expensive, because it includes one of the most precious metals in the world.	<a href="https://geology.com/articles/color-in-glass.shtml">https://geology.com/articles/color-in-glass.shtml</a>
Sulfur	Sulfur is also used in the process of coloring glass. If combined with a couple of other ingredients, can make a variety of yellows.	Without sulfur you would have to find an alternative and synthetic way to make yellow. It can even turn glass black if mixed with carbon and iron salts in the melting process.	<a href="https://geology.com/articles/color-in-glass.shtml">https://geology.com/articles/color-in-glass.shtml</a>
Iron oxide	Iron oxide is another element used in the process of coloring glass. This element is important because it helps create a variety of different colored glass.	Iron oxide helps produce different shade colors of green and brown when combined with other elements.	<a href="https://renegadeartglass.net/about-us/techniques/stained-glass/">https://renegadeartglass.net/about-us/techniques/stained-glass/</a>
Lead	In creating a stained glass window, lead is used to cool down the heating process of other coloring elements. Lead not only lowers melting temperatures, but is also used to connect one part of the stained glass seam to another. It provides somewhat of a border between the different types of stained glass.	The absence of lead would cause the creator to need to find an alternate way to cool the other coloring elements. No lead would also cause the need to find a new way to separate the different kinds of stained glass from one another.	<a href="https://www.comsol.com/blogs/the-science-behind-stained-glass/">https://www.comsol.com/blogs/the-science-behind-stained-glass/</a>
Silicon	Silicon is very important as it allows the glass staple to be created. Silicon gets fused together with silicon dioxide or silicon sand. Then, the silicon is cooled to form the final glass.	Without the silicon element, there would be no glass product to put the color on. Therefore, how would stained glass be created without the glass?	<a href="http://www.aquimicadascoisas.org/en/?episodio=the-chemistry-of-stained-glass#:~:text=The%20most%20common%20glass%20is,%E2%80%9D%20and%20%E2%80%9Cmelting%20agents%E2%80%9D.">http://www.aquimicadascoisas.org/en/?episodio=the-chemistry-of-stained-glass#:~:text=The%20most%20common%20glass%20is,%E2%80%9D%20and%20%E2%80%9Cmelting%20agents%E2%80%9D.</a>



# ACRYLIC PAINT

**A key ingredient of paint is the pigment. For the color to last and not fade there are many elements that go into them. Along with the color of paint, durability and composition includes even more elements.**

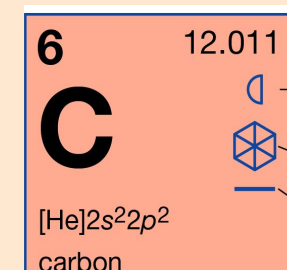
The elements in red pigment are cadmium, iron and oxygen. Iron and oxygen help absorb the yellow, green, and blue light, so these two elements are very important because they are what makes red paint get its color. The other element is cadmium which gives the paint the bright coloration that they need, so that they last a long time.



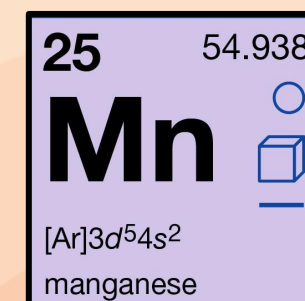
**To help with durability chromium is able to prevent and slow down corrosion. Along with corrosion protection, chromium can also give the paint a shiny finish. Not only can this element be used in acrylic paints but also primers. This multi-use element is therefore very beneficial in the art world.**



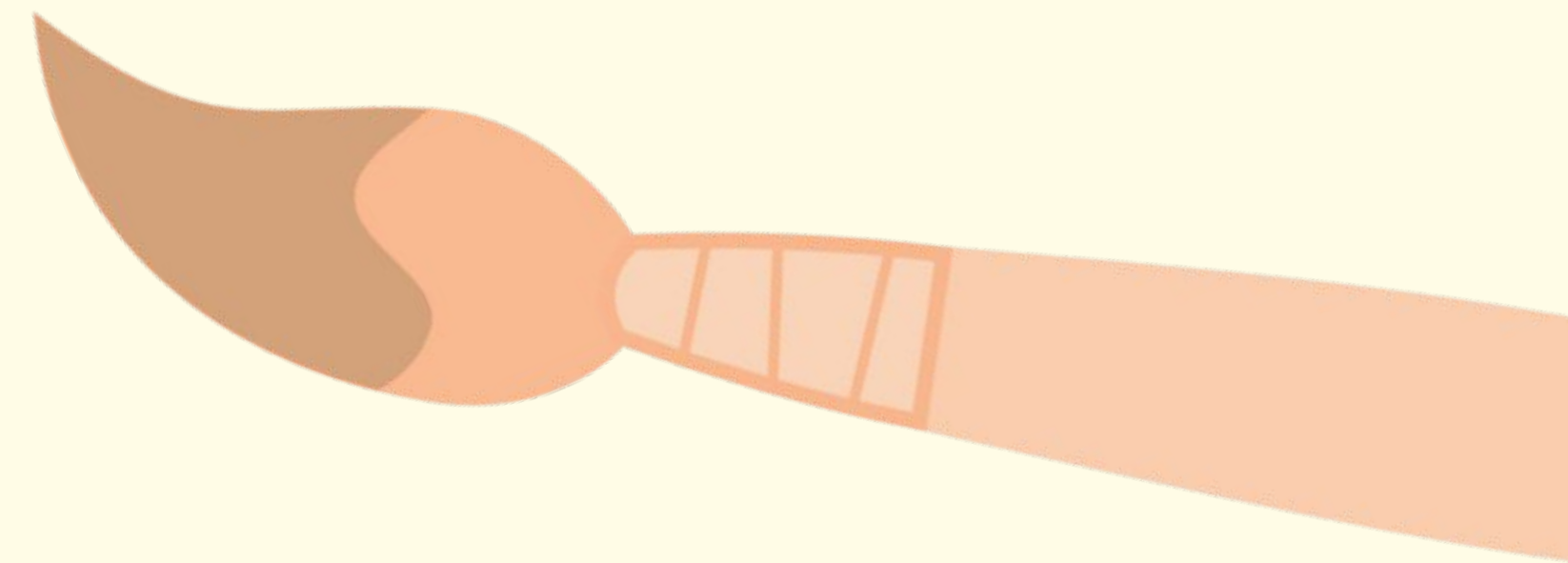
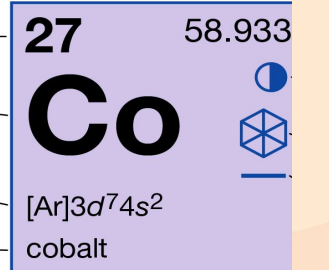
**Carbon is a natural found element in the production of making the black pigment of carbon black. Carbon black is what helps in the production of paints ranging from the darkest black to grey. However, it does have a fairly high tint strength which makes the pigment more useful in the production of black paint.**



**Manganese is an element that can be found in black paint. This is where black and brown pigments come from. Other side affects of manganese is that it can speed up the drying process.**



**Cobalt is a lighter and less intense pigment than purrsian blue. This element can be found in blue pigments and is specifically what gives sky blue it's pretty light but also deep blue color. The blue color also comes from the shiny silver color that is in cobalt, that's how it is able to be a light blue instead of dark like the purrsian blue pigment.**



# Research

Element	Relation to Object/Topic	Importance of Element	Reference(s)
<p><b><u>Cadmium</u></b></p> <p>This element can be found in red paint.</p>	<p>The element of cadmium relates to acrylic paint because it is found during the process of the pigmentation of the paint.</p>	<p>Cadmium is important to the process of pigmentation because it gives the red, yellow, and brown hues their bright coloration. This element is used because it doesn't fade for hundreds of years.</p>	<ul style="list-style-type: none"> <li>- <a href="https://www.art-is-fun.com/toxicity-of-acrylic-paint#:~:text=It%20is%20my%20understanding%20that,manganese%2C%20chromium%2C%20and%20lead.">https://www.art-is-fun.com/toxicity-of-acrylic-paint#:~:text=It%20is%20my%20understanding%20that,manganese%2C%20chromium%2C%20and%20lead.</a></li> <li>- <a href="https://www.chemistryislife.com/the-chemistry-of-acrylic-paint">https://www.chemistryislife.com/the-chemistry-of-acrylic-paint</a></li> <li>- <a href="https://news.artnet.com/art-world/ban-on-cadmium-pigments-could-change-art-forever-113493">https://news.artnet.com/art-world/ban-on-cadmium-pigments-could-change-art-forever-113493</a></li> </ul>
<p><b><u>Cobalt</u></b></p> <p>This element can be found in blue paint.</p>	<p>The element of cobalt is used in getting the pigment of blue in acrylic paint.</p>	<p>This element has a natural silver color and when used as a pigment it offers a vibrant blue color to the paint. Cobalt is what gives us the pigment of blue that can be used to make a variety of hues for different blue colors.</p>	<ul style="list-style-type: none"> <li>- <a href="https://www.art-is-fun.com/toxicity-of-acrylic-paint#:~:text=It%20is%20my%20understanding%20that,manganese%2C%20chromium%2C%20and%20lead.">https://www.art-is-fun.com/toxicity-of-acrylic-paint#:~:text=It%20is%20my%20understanding%20that,manganese%2C%20chromium%2C%20and%20lead.</a></li> <li>- <a href="https://blogs.scientificamerican.com/symbiotic/pinch-of-pigment-cobalt-blue/">https://blogs.scientificamerican.com/symbiotic/pinch-of-pigment-cobalt-blue/</a></li> <li>- <a href="https://www.chemistryislife.com/the-chemistry-of-acrylic-paint">https://www.chemistryislife.com/the-chemistry-of-acrylic-paint</a></li> </ul>
<p><b><u>Manganese</u></b></p> <p>This element can be found in grey paint.</p>	<p>Manganese in acrylic paint is used as a black-brown pigment in paint as filler in dry cell batteries.</p>	<p>The importance of manganese not only used to help dry the the cell batteries to prevent the formation of hydrogen, but it also removes green colors in glass and is a main drying component in black paint.</p>	<ul style="list-style-type: none"> <li>- <a href="https://www.livescience.com/29247-manganese.html#:~:text=Manganese%20used%20to%20make,filler%20in%20dry%20cell%20batteries.">https://www.livescience.com/29247-manganese.html#:~:text=Manganese%20used%20to%20make,filler%20in%20dry%20cell%20batteries.</a></li> <li>- <a href="https://pubchem.ncbi.nlm.nih.gov/element/Manganese#:~:text=It%20is%20used%20in%20dry,drying%20agent%20in%20black%20paints.">https://pubchem.ncbi.nlm.nih.gov/element/Manganese#:~:text=It%20is%20used%20in%20dry,drying%20agent%20in%20black%20paints.</a></li> </ul>
<p><b><u>Chromium</u></b></p> <p>This element can be found in yellow paint.</p>	<p>The element of chromium is added to paints and primers and it provides corrosion protection and reflective properties.</p>	<p>Chromium in paint is mainly used to impact the corrosion resistance and make it have a shiny finish. Chromium is not only very effective in paints, it is also effective in the textile and refractory industries because of its strong melting point and stable structure.</p>	<ul style="list-style-type: none"> <li>- <a href="https://www.osha.gov/Publications/OSHA_FS-3649_Bridge_Painting.pdf">https://www.osha.gov/Publications/OSHA_FS-3649_Bridge_Painting.pdf</a></li> <li>- <a href="https://www.lenntech.com/periodic/elements/cr.htm#:~:text=Chromium%20is%20used%20in%20metallurgy,for%20the%20firing%20of%20bricks.">https://www.lenntech.com/periodic/elements/cr.htm#:~:text=Chromium%20is%20used%20in%20metallurgy,for%20the%20firing%20of%20bricks.</a></li> </ul>
<p><b><u>Carbon</u></b></p> <p>This element can be found in black paint.</p>	<p>Carbon, a natural found element, is used in the process of making black paint from carbon black. As a naturally shiny element, it allows for easy pigmentation of a deep tone of black that can be easily applied to the acrylic paints.</p>	<p>In comparison to other elements that produce black pigment, carbon black is important because it has a very high tint strength. This means that even when the product is diluted with different mixes it still holds its deep black color. Carbon black is the pigment made from the element of carbon.</p>	<ul style="list-style-type: none"> <li>- <a href="http://www.madehow.com/Volume-1/Paint.html#:~:text=Hundreds%20of%20different%20pigments%2C%20both,commonly%20made%20from%20carbon%20black.">http://www.madehow.com/Volume-1/Paint.html#:~:text=Hundreds%20of%20different%20pigments%2C%20both,commonly%20made%20from%20carbon%20black.</a></li> <li>- <a href="https://kromaacrylics.com/pages/black-and-white-pigments">https://kromaacrylics.com/pages/black-and-white-pigments</a></li> <li>- <a href="https://nanopartikel.info/en/26-materialinfo/1183-industrieruss-carbon-black-uebersicht-2#:~:text=Carbon%20Black%20(CB)%20is%20a,liquid%20hydrocarbons%20under%20controlled%20conditions.">https://nanopartikel.info/en/26-materialinfo/1183-industrieruss-carbon-black-uebersicht-2#:~:text=Carbon%20Black%20(CB)%20is%20a,liquid%20hydrocarbons%20under%20controlled%20conditions.</a></li> </ul>