Magical Elements of Magic

Element 34

Selenium, Presented By Selenice

From The Magical Elements of the Periodic Table Book Series

Selenice

Selenium

By Sybrina Durant with Illustrations by Pranavva et al.

Selenice Presents Selenium

This Element 34 book features the periodic table element, Selenium. It is presented by Selenice, an Alchemical Wizard who wields a magical elemental staff with powers based on its periodic table element.

Selenice is just one of the 118 elementals who will present all of the Magical Elements of the Periodic Table to readers who are curious about the wonders of the world.

Selenice introduces the very magical element, Selinium, in her book.

The Alchemical Wizards and their other techno-magical friends are the perfect group to introduce you to the elements in the Periodic Table. Hopefully, this Magical Elements of the periodic table book will spark an interest in the magical and real world properties of all the elements known today. You may be surprised at how prominently they feature in our every day lives.

Each page in this book contains terms that might not be completely familiar to the reader. Refer to the definitions in the back of the book to get a clear understanding of each meaning.

There is also a fun elemental themed Periodic Table at the back of the book. It features 118 elements presented by fanciful characters like unicorns, dragons, wizards, knights and goblins.. They want you to remember that if there's no metal...there's no magic or technology.

Remember, "No metal - No Magic. . .and No Technology".

It's Techo-Magical.

Note: Sybrina Publishing websites are Sybrina.com and MagicalPTElements.com. Follow sybrinapublishing on Instagram, Magical Elements of the Periodic Table on Facebook, @sybrinad on Pinterest, Sybrina_SPT on Twitter; and Sybrina Durant on LinkedIn.

Selenium is a Non-Metal

Selenium was discovered in 1817 by Swedish chemist Jöns Jacob Berzelius (along with Johan Gottlieb Gahn) in Stockholm, Sweden. It was identified as a red-brown sediment in the sulfuric acid production chambers at a chemical plant in Gripsholm.

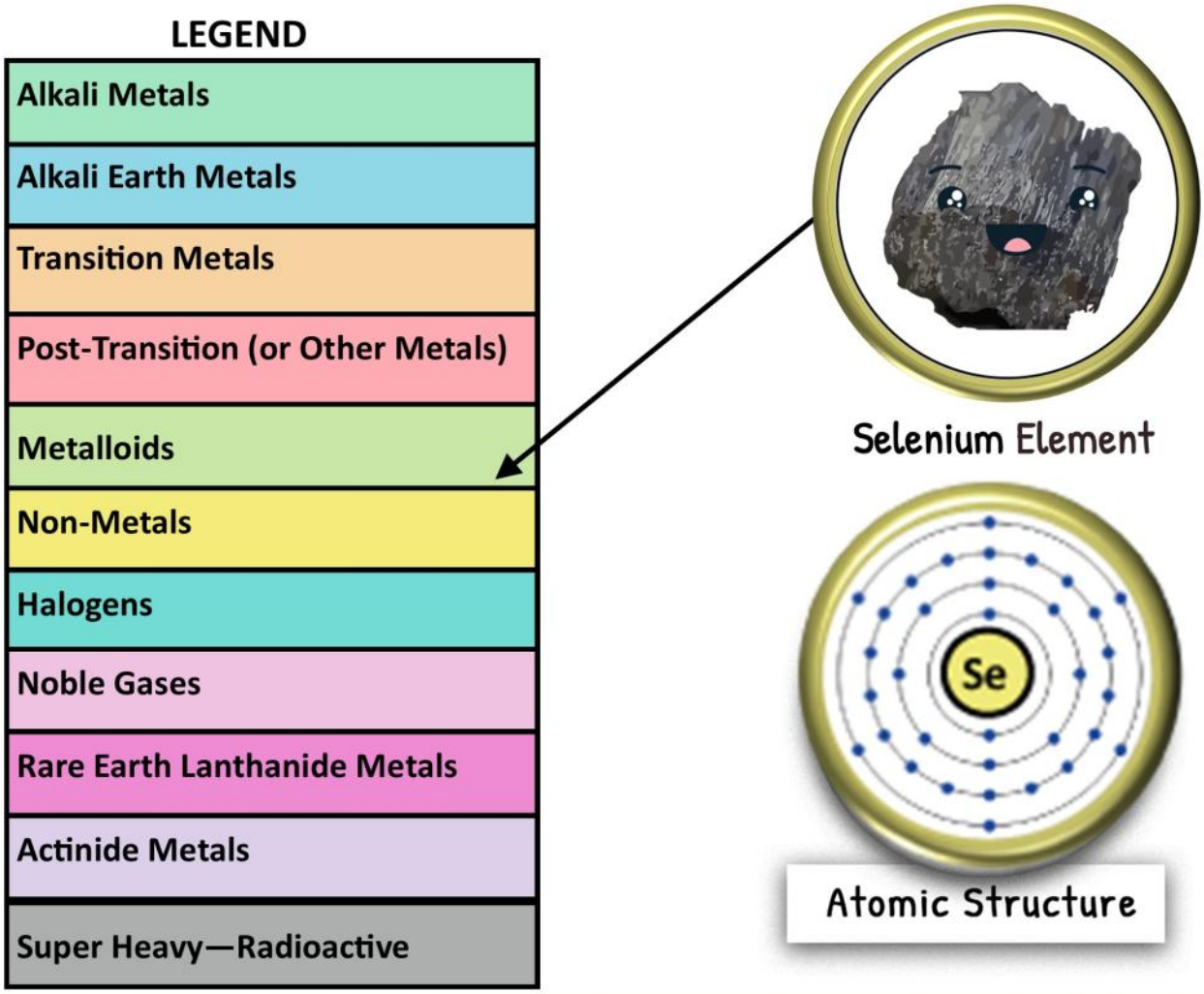
Selenium exists in three primary allotropic forms, primarily distinguished by their color and structure: metallic gray (stable, hexagonal, semiconductor), red (amorphous powder or monoclinic crystals), and black (vitreous/glassy solid). Gray selenium is the most stable form, while red and black forms are insulators that can be converted between types through heating and cooling.

Selenium is a p-type semiconductor (specifically in its gray crystalline form) that conducts electricity better than an insulator but not as well as a conductor.

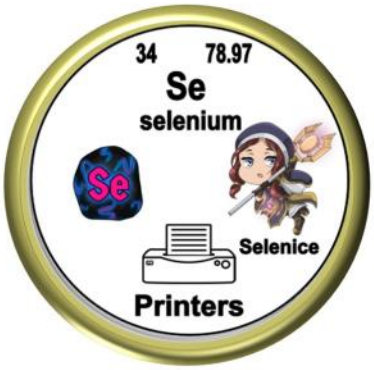
Solid elemental selenium is weakly attracted to external magnetic fields. However, its magnetic properties can vary based on allotropic form or, in the case of biogenic selenium nanomaterials, show strong paramagnetic behavior.

Selinium is neither ductile nor malleable. It is brittle and if subjected to force, it will break or turn into powder rather than changing shape.

Selenium (atomic number 34) is a Non-Metal element. Being a non-metal means Selenium is more of a "taker" or "sharer" of electrons rather than a "giver" (like metals are).



Non-Metals—These elements reside in columns 15-17, and can be gases, liquids, or solids. They don't conduct heat or electricity. The solids are brittle, and they have no metallic luster. They readily accept electrons from metals to form salts. These include nitrogen, oxygen, fluorine, chlorine, bromine, and iodine.



Selenium is an element with a fascinating and multifaceted history that intricately links it to the evolution of chemistry and our understanding of nonmetallic elements. Its story unfolds from the early 19th century and flows into modern technological applications, showcasing its significance across various fields such as electronics, material science, and even biology. By diving deeper into the historical, chemical, and biological aspects of selenium, we can appreciate its remarkable journey from discovery to its contemporary uses in our daily lives.

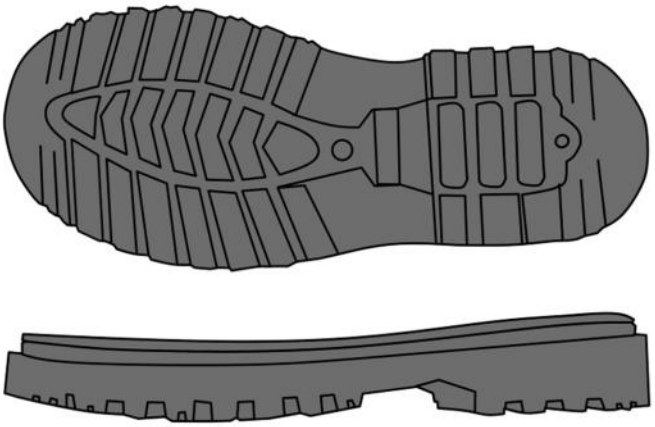
Selenium was first discovered in 1817 by Jöns Jacob Berzelius, a prominent Swedish chemist who played a crucial role in developing modern chemistry. Berzelius isolated selenium while he was actually conducting research on tellurium. Remarkably, he observed that selenium shared several physical and chemical characteristics with tellurium, which prompted him to further investigate this intriguing element. The name "selenium" derives from the Latin "selenium," a nod to Selene, the Greek goddess of the moon, reflecting the element's spectral similarities to tellurium, named after Tellus, the Earth. This naming convention artfully symbolizes the connection between these two elements, both of which emanate a silvery sheen.

In the early decades following its discovery, selenium experienced a surge of interest from scientists keen on exploring its chemical reactivity and spectral properties. Berzelius and his contemporaries identified various oxidation states of selenium and examined its ability to form compounds with both metals and nonmetals. Among the striking features of selenium were its allotropes, particularly the red and gray forms, which quickly captivated the scientific community. The gray crystalline form is metallic-looking and exhibits fascinating semiconducting properties, while the red polymeric form is significantly less conductive, resembling a molecular configuration more akin to polymers than metals.

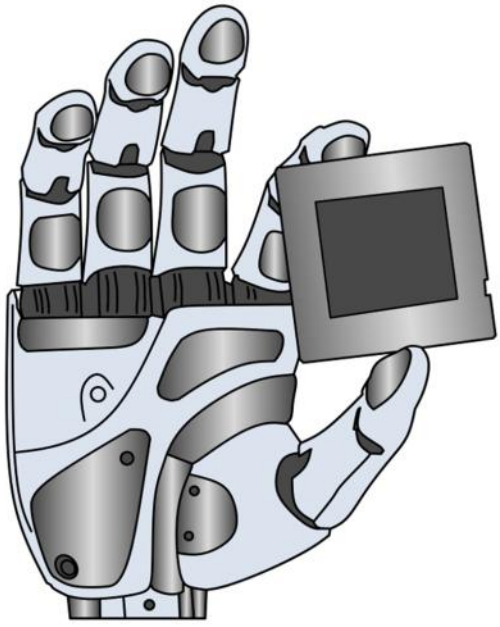
The late 19th century signaled a turning point for selenium, as its practical applications began to emerge. Scientists uncovered that selenium's ability to conduct electricity improves in the presence of light, leading to the development of light-sensitive devices that transformed how technology interacted with the natural world. One of the most notable innovations stemming from this discovery was the creation of selenium rectifiers and photoelectric cells, which utilized selenium's semiconductor-like behavior to convert light into electrical energy effectively. These early technologies would lay the groundwork for our modern understanding of photonics and semiconductor materials.

As the 20th century progressed, selenium's versatility continued to be explored, leading to its integration into a range of technological applications. In addition to its early roles in electricity and photography, selenium became increasingly relevant in the burgeoning fields of photocopying technologies, rectifiers, and solar cells. Its application in xerography, a critical process before the advent of modern laser technology, showcases how selenium played a significant role in advancing light-sensitive equipment. While silicon emerged as the dominant material in the field of semiconductors, selenium maintained its relevance by finding niche applications in various electronic devices and sensors.

Uses For Selinium



Selenium plays a crucial role in the rubber industry by being a key ingredient in the vulcanization process, which significantly enhances the properties of rubber. By incorporating selenium, manufacturers are able to create rubber that is not only stronger but also has a prolonged lifespan. This treatment allows the rubber to better maintain its shape, exhibit improved flexibility, and resist damage from various environmental factors, thereby ensuring that the final products meet quality standards and perform effectively over time.



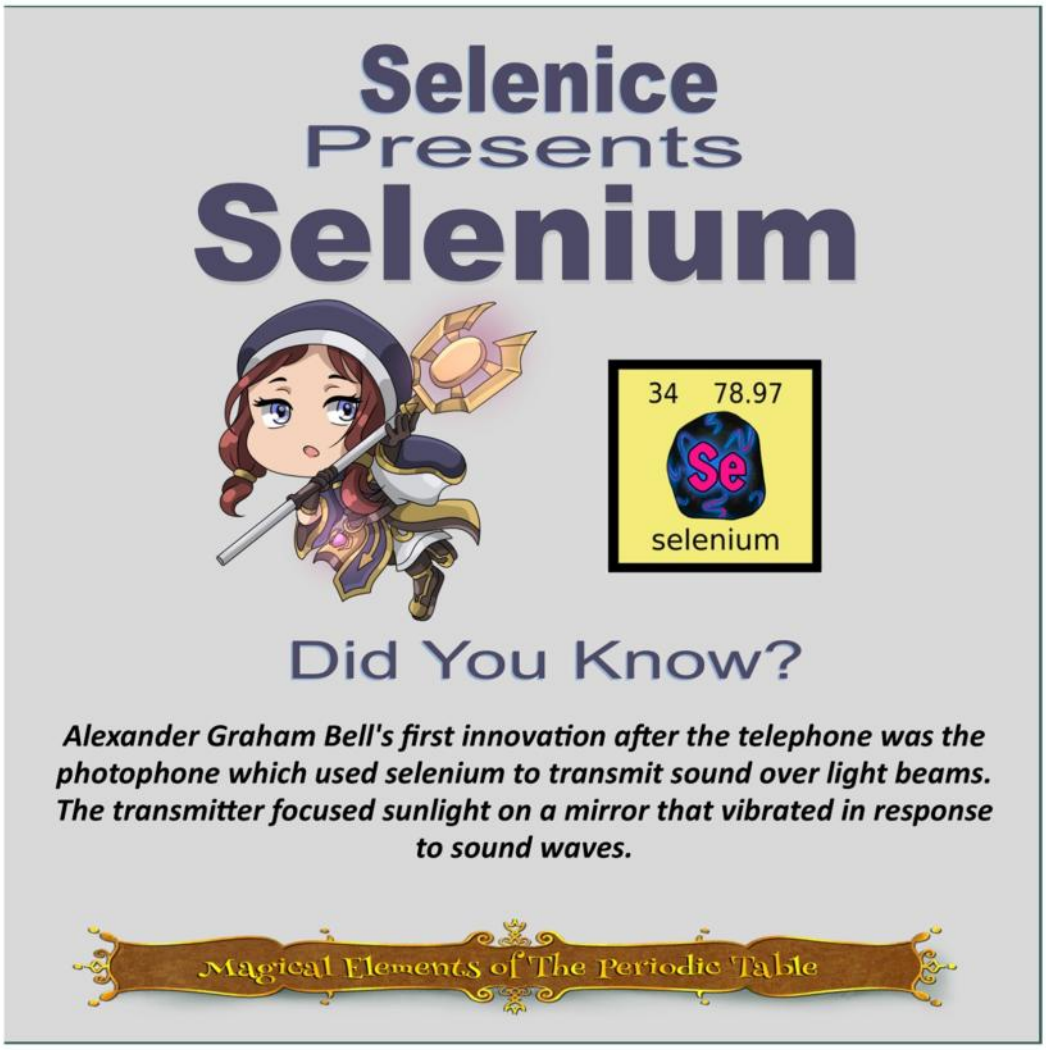
Selenium plays a crucial role in the development of hardware components for artificial intelligence systems. As a vital semiconductor material, selenium is utilized in various electronic devices, enabling efficient energy conversion and signal processing. Its unique properties, such as photoconductivity and temperature stability, make it particularly suitable for applications in sensors and solar cells, which are increasingly essential for powering AI technologies. By integrating selenium into the hardware components of AI systems, developers can enhance performance and reliability. This advancement supports the growing demand for more efficient data processing and machine learning capabilities, ultimately contributing to the evolution of smarter AI solutions.

The Source of Selenium

Selenium is found in metal sulfide ores, where it substitutes for sulfur. Some minerals containing these ores are chalcopyrite, sphalerite, galena and pyrite. Commercially, selenium is produced as a byproduct in the refining of these ores.

Selenium is a fascinating element that, unlike many others, is not found in nature in its pure, uncombined form. Instead, it occurs primarily as a compound, existing largely in association with various other elements. This characteristic places Selenium within a network of minerals, often embedded alongside metals such as copper, lead, and silver. One of the principal sources from which we extract Selenium is a mineral known as selenite. This mineral plays a pivotal role in the processes that allow us to acquire Selenium, a trace element used in various industries. Furthermore, seleniferous minerals—those specifically known to harbor Selenium—are essential sources that enrich our understanding of where this element can be found.

The journey of Selenium extraction begins with mining, which is the foundational step in accessing this unique element. When mining operations focus on extracting metals, especially copper, inadvertent extraction of Selenium occurs as well. The ore extracted from the Earth's crust often contains this valuable element. The refining of copper ore not only yields copper but also enables the separation and collection of Selenium. This process underscores the interconnected nature of the mining and metallurgy industries.



- Selenium derives its name from the ancient Greek word "selēnē," which translates to "moon." This nomenclature reflects its close relationship with tellurium, a chemical element named after the Latin term for earth, "tellus." The naming conventions for both elements illustrate their respective connections to celestial and terrestrial bodies.
- When pyrite extracted from the historic Falun Mine, renowned for being the first location where selenium was discovered, is subjected to burning, it produces a striking red solid. This remarkable transformation is accompanied by a pungent aroma reminiscent of horseradish, adding a unique olfactory characteristic to the chemical reaction.
- When it's dark, selenium exhibits poor conductivity for electricity, making it an inefficient conductor. However, when you shine a light on it, its ability to conduct electricity significantly improves, and this enhancement is directly proportional to the brightness of the light. Interestingly, selenium also possesses a unique property that allows it to convert light energy directly into electricity, showcasing its dual role in facilitating electrical conduction and energy transformation.

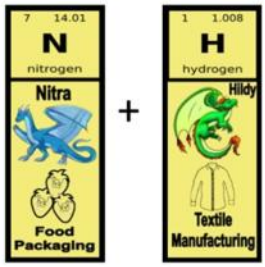
Polyatomic Ions

While individual elements are typically not polyatomic, certain elements can form polyatomic molecules or ions. Many polyatomic ions exist, formed by groups of atoms covalently bonded together with an overall charge. Polyatomic ions carry a net electric charge, either positive (cation +) or negative (anion -). Despite being made of multiple atoms, polyatomic ions behave as a single, distinct entity in chemical reactions and compounds.

Ammonium =

(NH4+)

Contains one nitrogen and four hydrogen atoms.

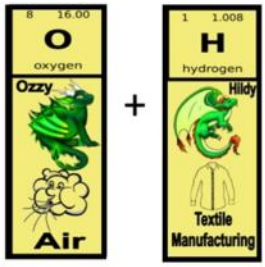


Ammonium is widely used in agriculture as a fertilizer and in industrial applications for cleaning, refrigeration, and chemical manufacturing.

Hydroxide =

(OH-)

Contains one oxygen and one hydrogen atom.

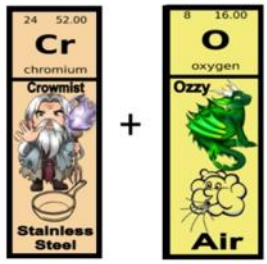


Hydroxide is commonly used for cleaning, paper production, water treatment, food processing, and as a component in pharmaceuticals and various industrial processes

Chromate =

(CrO4 -2)

Contains one chromium and four oxygen atoms.



Chromate is commonly used for corrosion prevention on metals, as a pigment in paints and dyes, and in leather tanning. It also finds applications in cement and mortar, and as a corrosion inhibitor in cooling water systems.

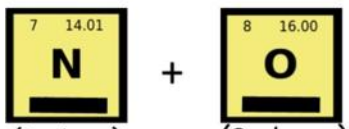
Sulfate =

(SO4 2-)

Contains one sulfur and four oxygen atoms.

Sulfates are found in detergents, shampoos, and other cleaning products as surfactants, which help create lather and remove dirt and oil. Additionally, sulfates are used in agriculture, medicine, and industrial processes.

Can you guess the most commonly used polyatomic ion?



= ??????

The above chart only shows a few of the polyatomic ions formed by those elements. There is no known fixed finite number of polyatomic ions but some other important ones are:

Carbonate (CO3 2-): Crucial in construction, medicine, agriculture, and food production. **Phosphate (PO4 3-):** Most notably used in fertilizers to enhance plant growth, in animal feed supplements, and in cleaning products. **Acetate (CH3COO-):** Used in the preparation of metal acetates, used in some printing processes; vinyl acetate, employed in the production of plastics; cellulose acetate, used in making photographic films and textiles.

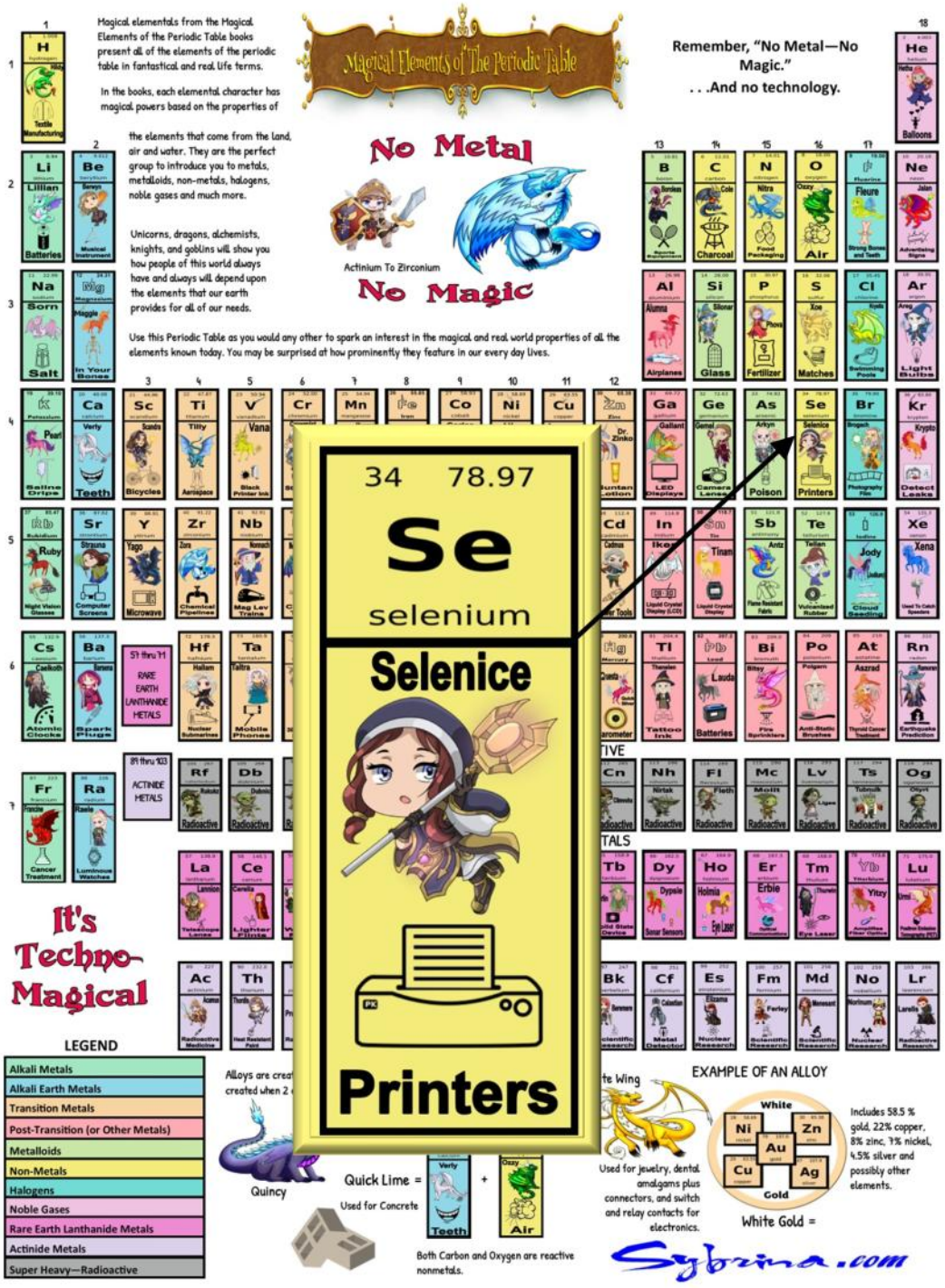
The most commonly used Polyatomic Ion is ***Nitrate (NO3-)*** : Primarily used in medicine, food preservation, and as fertilizers .

Selenice The Wizard With The Selenium Staff

Symbol: Se Atomic Number: 34 Atomic Mass: 78.97

Selenium resides in Group 16 Period 4 on the Periodic Table.

The atomic symbol is Se. Its Atomic Number is 34. Its Atomic Mass is 78.97.



Meet Selenice, The Wizard With The Selenium Tipped

The valley wore two faces that day: one old as the hills, one bright with screens and buzzing devices that hummed like distant bees. In the town of Brindlewick, where thatched roofs met glass towers, the clash of eras was not a battle but a conversation, each side listening for the other's tune. At the heart of Brindlewick's square stood a figure both familiar and uncanny: Selenice. This wizard exudes a charming blend of courage and cautious curiosity. Small in stature but mighty in presence, she drapes her outfit in regal purples, golds, and moonlit whites, hinting at a lineage of arcane tradition. Her hooded cloak frames a determined face, with wide, expressive blue eyes that gleam with wonder and a hint of mischief. A neatly braided chestnut braid peeks from beneath the hood, suggesting practicality and discipline.

Her staff is a gleaming instrument of power: a long silver shaft topped by an ornate, sun-kissed headpiece that radiates authority and focus. The staff's design—the geometric gold motifs and the central gem—speaks of precise, methodical magic rather than flashy showmanship. She grips it with confident, gloved hands that signal readiness for spells, wards, or whimsical experiments. She moves with a light, almost playful agility, as pink petals or sparkles swirl around her, enhancing the sense that magic is both delightful and delicate in her care. Selenice is a steadfast guardian of wonder.

But her power extends beyond the old textbooks and mythic sigils. The town's new age infrastructure—fiber lines, municipal drones, solar ferries gliding along the river—bounds Brindlewick into a web of circuits and signals. Selenice had learned to walk both pathways at once: the ancient path of incantation and the modern route of code and circuitry. She easily controls computers, smartphones, and other cool gadgets. With her powers, she can do things like change information, mess up computer systems, or protect against tech dangers. She can jump into digital worlds, move data around, and block bad electronic stuff. Yet she never wields power recklessly; she tempers the lust for control with the discipline of an old-world mage who remembers every spell invites a price.

The first test came on a fog-veiled morning when Brindlewick's river, a lifeline for mills and markets, stuttered to a halt. The water's gleam dulled to pewter; fish paused, and a chorus of worry rose from the docks where merchants counted their wares as if counting their breaths. The mayor—a pragmatic woman with copper wire spectacles and a smile that had weathered many storms—called for help. Windows in the municipal building flickered with alert icons: a cluster of emojis that looked like tiny thunderstorms. The town's old clock tower rang once, twice, then paused, as if listening.

Selenice stood at the square's edge, her staff catching the last light of dawn, a sun-kissed crown of gold at its head. The pink petals that swirled around her paused mid-air, as if listening, too. She spoke with that calm cadence that made even the most frantic heart slow. This is not a show, she reminded them in a voice that could travel across centuries and also across networks. This is a conversation, a negotiation between what has always been and what must be.

Her staff hummed with a quiet resonance, not the roar of a dragon, but the steady heartbeat of a doe—listen first, act second. The central gem pulsed in time with the river's own heartbeat, which felt almost like an echo from a distant memory. She asked a simple question, one that bridged old wisdom and modern need: Where does this murk begin, and where does it end? Then she did what a good guardian does—listen first, act second.

Enjoy This Coloring Page Featuring

Selenice The Wizard With The Selenium Tipped Staff

Magical Elements of The Periodic Table

Create Your Own Magical Dragon Elemental

Selenice The Wizard With The Selenium Staff

Symbol: Se Atomic Number: 34 Atomic Mass: 78.97

Magical Elemental Symbol

34 78.97
Se
selenium

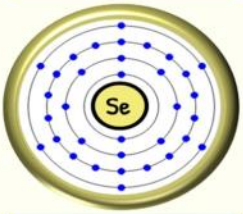
Selenium is a Non-Metal

Extracted From Chalcopyrite

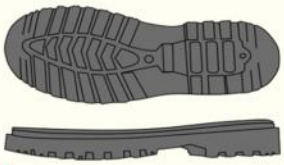
Selenium Periodic Symbol

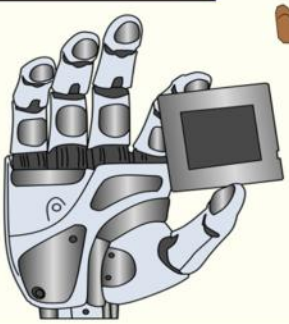
Selenice's Magical Abilities

Selenice can easily control computers, smartphones, and other cool gadgets. With her powers, she can do things like change information, mess up computer systems, or protect against tech dangers. She can jump into digital worlds, move data around, and block bad electronic stuff.



Atomic Structure





Symbol: Atomic Number: Atomic Mass:

Magical Elemental Symbol

Selenium Periodic Symbol

Atomic Structure

Magical Abilities

Uses For

Magical Wizard Elemental Research Sheet

Before starting your Magical Wizard Elemental graphics page, do some research on your chosen element.

Name of Magical Wizard:	
Wizards's Magic Power Based on the Element's Properties:	
Magical Elemental Symbol:	
Element Name:	
Element Symbol:	
Atomic Number:	
Atomic Mass:	
What year and where was this Element discovered?	
Who discovered this Element?	
Element Group:	
Element Period:	
Element Family Name:	
State of Element At Room Temperature:	
What is Element Mined or Extracted From?	
Is Element Magnetic?	
Does Element Conduct Electricity?	
Where is the Element commonly found in Nature?	
What is 1 alloy of the Element? How used?	
What is 1 compound of the Element? How used?	
Name the most common use for this Element:	
Name a little known use for this Element:	
Name one more use for this Element:	
Interesting and Fun Facts:	

Write a paragraph below to describe your magical wizard elemental. Based on the information obtained from research of your chosen element, how did you determine your wizard's name? What are your wizard's magic powers? What are their likes/dislikes, strengths/weaknesses, personality traits? What color are your wizards clothes and why did you pick that color? What is your wizard's Magical Elemental Symbol?

I hope you enjoyed this sample

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please spread the word to teachers,

home schoolers and anyone else who might enjoy it.