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Chapter 1 : Group 3 Elements - Periodic Table Trends

No headers. As shown in Table , the observed trends in the properties of the group 3 elements are similar to those of groups 1 and 2. Due to their ns 2 (n âˆ' 1)d 1 valence electron configurations, the chemistry of all four elements is dominated by the +3 oxidation state formed by losing all three valence electrons.

Other d-block groups are composed of four transition metals , [note 6] and group 3 is sometimes considered to follow suit. Scandium and yttrium are always classified as group 3 elements, but it is controversial which elements should follow them in group 3, lanthanum and actinium or lutetium and lawrencium. Scerri has proposed a resolution to this debate on the basis of moving to a column table and consideration of which option results in a continuous sequence of atomic number increase. He thereby finds that group 3 should consist of Sc, Y, Lu, Lr. Normally, the rd electron would enter the d-subshell, but quantum mechanical research has found that the configuration is actually [Rn]7s25fp1 [note 7] due to relativistic effects. Lanthanum and actinium are sometimes considered the remaining members of group 3. However, different behavior is observed in other d-block groups, especially in group 4, in which zirconium, hafnium and rutherfordium share similar chemical properties lacking a clear trend. It has however been argued that this is irrelevant because the principle of increasing basicity down the table is more fundamental, and because the behavior of the group 3 elements is more similar to their s-block neighbors than their d-block neighbors. In other tables, lutetium and lawrencium are classified as the remaining members of group 3. Since the f-shell is nominally full in the ground state electron configuration for both of these metals, they behave most similarly to other period 6 and period 7 transition metals compared to the other lanthanides and actinides, and thus logically exhibit properties similar to those of scandium and yttrium. However, this resemblance in not unique to lutetium and lawrencium, but is common among all the late lanthanides and actinides. Some tables, including the one published by IUPAC [58] refer to all lanthanides and actinides as being in group 3: Lanthanides, as electropositive trivalent metals, all have a closely related chemistry, and all show many similarities to scandium and yttrium, but they also show additional properties characteristic of their partially filled f-orbitals which are not common to scandium and yttrium. Exclusion of all elements is based on properties of earlier actinides, which show a much wider variety of chemistry for instance, in range of oxidation states within their series than the lanthanides, and comparisons to scandium and yttrium are even less useful. Apparently, group 3 comprising 32 elements as older periodic tables show is not considered. The La and Ac variant remains the most common in the literature, despite some calls for a change to the Lu and Lr variant. In terms of chemical behaviour, [62] and trends going down group 3 for properties such as melting point, electronegativity and ionic radius, [63] [64] scandium, yttrium, lanthanum and actinium are similar to their group 1â€"2 counterparts. In this variant, the number of f electrons in the most common trivalent ions of the f-block elements consistently matches their position in the f-block. PO4, which contains 0. The elements, after purification from other rare-earth metals, are isolated as oxides; the oxides are converted to fluorides during reactions with hydrofluoric acid. No group 3 element has any documented biological role in living organisms. The radioactivity of the actinides generally makes them highly toxic to living cells, causing radiation poisoning. Scandium has no biological role, but it is found in living organisms. Once reached a human, scandium concentrates in the liver and is a threat to it; some its compounds are possibly carcinogenic , even through in general scandium is not toxic. Scandium is mostly dangerous in the working environment, due to the fact that damps and gases can be inhaled with air. This can cause lung embolisms, especially during long-term exposure. The element is known to damage cell membranes of water animals, causing several negative influences on reproduction and on the functions of the nervous system. Soluble lutetium salts are mildly toxic, but insoluble ones are not. However, it is essential for the methanotrophic bacterium Methylacidiphilum fumariolicum SolV, although the general similarity of the rare earths means that it may be substituted by some of the other early lanthanides with no ill effects. The same is true for actinium. In addition, the element of the cerium and thorium families are also included in the sub-group. Sc 21 Y 39 La 57 Atomic wt.

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Chapter 2 : The periodic table - classification of elements (video) | Khan Academy

The group 3 elements are a group of chemical elements in the periodic calendrierdelascience.com group, like other d-block groups, should contain four elements, but it is not agreed what elements belong in the group.

Lr The Group 3 elements are chemical elements comprising the third vertical column of the periodic table. IUPAC has not recommended a specific format for the periodic table, so different conventions are permitted and are often used for group 3. The following d-block transition metals are always considered members of group 3: See group number of lanthanides and actinides: Some tables [1] include lanthanum La and actinium Ac , the beginnings of the lanthanide and actinide series of elements, respectively as the remaining members of group 3. In their most commonly encountered tripositive ion forms, these elements do not possess any partially filled f orbitals , thus resulting in more d-block -like behavior. Some tables [2] include lutetium Lu and lawrencium Lr as the remaining members of group 3. These elements terminate the lanthanide and actinide series, respectively. Since the f-shell is nominally full in the ground state electron configuration for both of these metals, they behave most like d-block metals out of all the lanthanides and actinides, and thus exhibit the most similarities in properties with Sc and Y. For Lr, this behavior is expected, but it has not been observed because sufficient quantities are not available. Also see Periodic table wide and Periodic table extended. Some tables [3] refer to all lanthanides and actinides by a marker in group 3. A third and fourth alternative are suggested by this arrangement: The third alternative is to regard all 30 lanthanide and actinide elements as included in Group 3. Lanthanides, as electropositive trivalent metals, all have a closely related chemistry, and all show many similarities to Sc and Y. The fourth alternative is to include none of the lanthanides and actinides in group 3. The lanthanides possess additional properties characteristic of their partially-filled f orbitals which are not common to Sc and Y. Furthermore, the actinides show a much wider variety of chemistry for instance, in range of oxidation states within their series than the lanthanides, and comparisons to Sc and Y are even less useful. Biological chemistry Group 3 elements are generally hard metals with low aqueous solubility, and have low availability to the biosphere. No group 3 has any documented biological role in living organisms. The radioactivity of the actinides generally makes them highly toxic to living cells.

Chapter 3 : Group_3_element

Group 3 is a group of elements in the periodic calendrierdelascience.com group, like other d-block groups, should contain four elements, but it is not agreed what elements belong in the group.

Red phosphorus is an amorphous solid. It is more stable and explodes at temperatures higher than those of white phosphorus. It is still, however, dangerously reactive. Both forms of phosphorus are insoluble in water and can be interconverted with various applications of heat, pressure, and light. There also exist black phosphorus and violet phosphorus. Unlike nitrogen, phosphorus will not readily form a diatomic molecule with a triple bond. Phosphorus pentoxide strongly reacts with water to form phosphoric acid, a substance that removes rust from iron, especially on ships; it is often known as "naval jelly". But phosphoric acid is corrosive to flesh and not to be touched. Phosphorus is essential to life in the form of phosphates in bones and in substances known as ADP and ATP that transform food into useful energy in cells. Others[edit] A crystal of bismuth, showing its colorful iridescent tarnish. Arsenic is similar to phosphorus. It has three allotropes: Grey arsenic is the most common form. Its structure is similar to graphite. Antimony does not have physical properties of a metal, but behaves chemically as a non-metal. Arsenic and antimony, as well as practically all of their compounds, are dangerous poisons. Bismuth is a brittle, silvery metal. Bismuth is actually radioactive, decaying into thallium Because its half-life is 19 x years, about a million times the age of the universe, bismuth is usually considered stable. Bismuth is much less radioactive than the nearly-harmless and unavoidable radioactive isotopes of carbon and potassium in living things. In fact, a bismuth compound is very common in a heavily-used stomach medication that requires no prescription.

Chapter 4 : chemical reactions of period 3 elements

Most of the elements in this group lose those three valence electrons and get a +3 charge, otherwise known as a +3 oxidation state. Atoms with a positive charge are called cations, so most of.

Reactions with water Sodium Sodium has a very exothermic reaction with cold water producing hydrogen and a colourless solution of sodium hydroxide. Magnesium Magnesium has a very slight reaction with cold water, but burns in steam. A very clean coil of magnesium dropped into cold water eventually gets covered in small bubbles of hydrogen which float it to the surface. Magnesium hydroxide is formed as a very thin layer on the magnesium and this tends to stop the reaction. Magnesium burns in steam with its typical white flame to produce white magnesium oxide and hydrogen. If you are heating the magnesium in a glass tube, the magnesium also reacts with the glass. That leaves dark grey products including silicon and perhaps boron from the glass as well as the white magnesium oxide. Notice also that the oxide is produced on heating in steam. Hydroxides are only ever produced using liquid water. Aluminium Aluminium powder heated in steam produces hydrogen and aluminium oxide. The reaction is relatively slow because of the existing strong aluminium oxide layer on the metal, and the build-up of even more oxide during the reaction. Silicon There is a fair amount of disagreement in the books and on the web about what silicon does with water or steam. The truth seems to depend on the precise form of silicon you are using. The common shiny grey lumps of silicon with a rather metal-like appearance are fairly unreactive. Most sources suggest that this form of silicon will react with steam at red heat to produce silicon dioxide and hydrogen. But it is also possible to make much more reactive forms of silicon which will react with cold water to give the same products. These more reactive forms are produced as powders. A correspondent from the silicon industry tells me that when silicon is cut into slices, the silicon dust formed reacts with water at room temperature - producing hydrogen and getting very hot. He says "The silicon is cut in a glycol slurry [. One source suggests that the lack of reactivity of silicon is due to a layer of silicon dioxide on its surface. Phosphorus and sulphur These have no reaction with water. Chlorine Chlorine dissolves in water to some extent to give a green solution. A reversible reaction takes place to produce a mixture of hydrochloric acid and chloric I acid hypochlorous acid. You may also find the chloric I acid written as HClO. The form I have used more accurately reflects the way the atoms are joined up. In the presence of sunlight, the chloric I acid slowly decomposes to produce more hydrochloric acid, releasing oxygen gas, and you may come across an equation showing the overall change: Argon There is no reaction between argon and water. Reactions with oxygen Sodium Sodium burns in oxygen with an orange flame to produce a white solid mixture of sodium oxide and sodium peroxide. For the simple oxide: Magnesium Magnesium burns in oxygen with an intense white flame to give white solid magnesium oxide. If magnesium is burns in air rather than in pure oxygen, it also reacts with the nitrogen in the air. You get a mixture of magnesium oxide and magnesium nitride formed. Aluminium Aluminium will burn in oxygen if it is powdered, otherwise the strong oxide layer on the aluminium tends to inhibit the reaction. If you sprinkle aluminium powder into a Bunsen flame, you get white sparkles. White aluminium oxide is formed. Silicon Silicon will burn in oxygen if heated strongly enough. Silicon dioxide is produced. It depends on what sort of silicon you are talking about and how finely divided it is. For example, one of the amorphous non-crystalline powder forms of silicon even catches fire spontaneously in air at room temperature. Other forms need higher temperatures and a richer oxygen supply. Phosphorus White phosphorus catches fire spontaneously in air, burning with a white flame and producing clouds of white smoke - a mixture of phosphorus III oxide and phosphorus V oxide. The proportions of these depend on the amount of oxygen available. In an excess of oxygen, the product will be almost entirely phosphorus V oxide. For the phosphorus III oxide: For the phosphorus V oxide: You may come across these oxides written as P2O3 and P2O5. They are as logical as writing, say, ethene as CH2 and ethane as CH3. Sulphur Sulphur burns in air or oxygen on gentle heating with a pale blue flame. It produces colourless sulphur dioxide gas. Sulphur dioxide can, of course, be converted further into sulphur trioxide in the presence of oxygen, but it needs the presence of a catalyst and fairly carefully controlled conditions. If you are interested in this, see the page on the Contact Process. Reactions with chlorine Sodium burns in chlorine with a bright orange flame. White solid sodium chloride is produced. Magnesium Magnesium burns with its usual intense white flame to give white magnesium chloride. Aluminium Aluminium is often reacted with chlorine by passing dry chlorine over aluminium foil heated in a long tube. The aluminium burns in the stream of chlorine to produce very pale yellow aluminium chloride. This sublimes turns straight from solid to vapour and back again and collects further down the tube where it is cooler. You may find versions of this equation showing the aluminium chloride as Al2Cl6. In fact, this exists in the vapour at temperatures not too far above the sublimation temperature - not in the solid. The structure of aluminium chloride is discussed on the page about Period 3 chlorides. If you follow this link, use the BACK button on your browser to return to this page. Silicon If chlorine is passed over silicon powder heated in a tube, it reacts to produce silicon tetrachloride. This is a colourless liquid which vaporises and can be condensed further along the apparatus. Phosphorus White phosphorus burns spontaneously in chlorine to produce a mixture of two chlorides, phosphorus III chloride and phosphorus V chloride phosphorus trichloride and phosphorus pentachloride. Phosphorus III chloride is a colourless fuming liquid. Phosphorus V chloride is an off-white going towards yellow solid. These equations are often given starting from P rather than P4. It depends which form of phosphorus you are talking about. If you are talking about white phosphorus as I am here , P4 is the correct version. If you are talking about red phosphorus, then P is correct. Red phosphorus has a different polymeric structure, and P4 would be wrong for it. Sulphur If a stream of chlorine is passed over some heated sulphur, it reacts to form an orange, evil-smelling liquid, disulphur dichloride, S2Cl2. Questions to test your understanding If this is the first set of questions you have done, please read the introductory page before you start.

Chapter 5 : Physical and Chemical Properties of Period 3 Elements by C O on Prezi

The group number is an identifier used to describe the column of the standard periodic table in which the element appears. Groups termed s-block elements. Groups (except hydrogen) and are termed main group elements.

Boron forms mostly covalent bonds, while the other elements in Group 3A form mostly ionic bonds. The Group 3A metals have three valence electrons in their highest-energy orbitals ns2p1. The Group 3A metals are silvery in appearance, and like all metals are good conductors of electricity. They are relatively soft metals, with lower melting points than many of the Group 2A metals. Boron is found as shiny black crystals, or as an amorphous brown powder. The name of the element is derived from buraq, the Arabic word for borax. Boron is classified as a metalloid , having properties of both metals and nonmetals: Many boron salts emit a green color when heated. Borate salts are used in the refining of metals, in the manufacture of glass, in fertilizers boron is necessary for plant growth , and in detergents. Pyrex glassware is a borosilicate glass introduced by Corning Glass Works in ; it is widely used in laboratories because it does not expand on heating as much as ordinary glass, and it is much more resistant to breaking. Boric acid is used in many insecticides. Boron can also form extremely hard materials with nitrogen and carbon; boron nitride, BN, is similar in strength and appearance to diamond, and is used as an abrasive. Aluminum is a relatively soft, silvery, malleable metal. The name of the element is derived from the Latin word for alum, alumen. In Europe, the name is spelled "aluminium," while in the United States, it is spelled "aluminum. Despite its ubiquity, it was a valuable substance for a long time because of the extreme difficulty of obtaining it in its elemental, metallic form. Aluminum can be obtained from bauxite ore by heating, but this requires such high temperatures that this is a very inefficient â€” and expensive â€” process. The molten aluminum that forms under these conditions pools up at the bottom of the electrolytic cell, where it can be drained off and cast into large blocks, which can then be rolled out to whatever thickness is desired. Aluminum oxidizes in air to form aluminum oxide, Al2O3. Unlike oxidized iron rust, Fe2O3 , the oxidized aluminum does not flake off: Aluminum is strong and lightweight, and is used in many applications ranging from construction to cookware. Aluminum is often alloyed with other metals to improve its strength and mechanical properties. Aluminum and its alloys are used in aircraft and automobile frames, rockets, window frames, doors, siding, kitchenware, packaging aluminum cans, aluminum foil , electrical wiring although aluminum has a higher resistance than copper, it is cheaper , as a silvering agent in paints usually in powdered form , in heat sinks, and many other uses. Aluminum oxides are the basis for many gemstones, such as sapphires and rubies: Potassium aluminum sulfate, KAl SO4 2, also known as alum, has been used for centuries as a mordant in dyeing, and in medicines as an astringent a substance which causes tissues and blood vessels to contract to stop bleeding. In the form of styptic pencils, alum was an essential ingredient in shaving until the development of safety razors. Gallium is a soft, silvery-white metal with a low melting point The name of the element is derived from Gallia, the Latin name for France although it has been suggested that its discoverer, Paul-Emile Lecoq de Boisbaudran, snuck his own name into the periodic table, since the name "Lecoq", which means "rooster" in French, translates into Latin as gallus. It is found in trace amounts in n bauxite, coal, diaspore, germanite, and sphalerite. The existence of gallium was predicted by Dimitri Mendeleev in from a blank space in his periodic table beneath aluminum; before it was actually found, the hypothetical element was referred to as "eka-aluminum" eka is the Sanskrit word for "one," meaning that it was one space away from aluminum on the periodic table. When gallium was discovered in , its physical and chemical properties matched many of those predicted by Mendeleev from its position in his table. Gallium arsenide, GaAs, is a semiconductor, and is used in making LEDs, transistors, and diodes used in lasers. It is also heavily used in computer circuitry. Indium is a soft, silvery metal. The name of the element is derived from the Latin word for indigo, indicum, because of the bright violet line of its atomic spectrum. It is found in the rare mineral indite [FeIn2S4], and in trace emounts in some zinc ores; it has also been found as the free metal. Indium is used in alloys with other metals to lower their melting points, and is also used in some dental appliances. Thallium is a soft, gray metal; unlike the other Group 3A metal, its oxides flake away from the rest of the metal, exposing a fresh surface for more oxidation to take place on. A History of Poison, References John Emsley, The Elements, 3rd edition. An A-Z Guide to the Elements. Oxford University Press, Heiserman, Exploring Chemical Elements and their Compounds.

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Chapter 6 : WebElements Periodic Table Â» Periodicity Â» Group numbers Â» group 3

The elements in Group 1 are: These elements are known as alkali metals.. Physical Properties of Group 1 Elements. 1. Table shows some properties of Group 1 elements.

The oxide also behaves as an acidic oxide by dissolving in strong soluble bases to form aluminate III salts. Reaction of aluminium with chlorine: Aluminium chloride is a curious substance in its behaviour. In doing so the coâ€"ordination number of the aluminium changes from six to four to form the readily vapourised covalent dimer molecule, Al2Cl6, shown above. The reaction with bromine is similar and forms the covalent dimer molecule Al2Br6 directly Reaction of aluminium with water: None due to protective oxide layer. Reactions of the hexaâ€"aqua aluminium ion: It gives a gelatinous white precipitate with sodium hydroxide or ammonia solution which displays amphoteric behaviour by dissolving in excess strong alkali NaOH aq , NOT NH3 aq and acids. With aqueous sodium carbonate solution, the hydroxide ppt. Sodium carbonate is not a strong enough baseâ€"alkali to dissolve the aluminium hydroxide precipitate. The extraction of aluminium Aluminium is obtained from mining the mineral bauxite. The purified bauxite ore of aluminium oxide is continuously fed in. Cryolite is added to lower the melting point and dissolve the ore. Ions must be free to move to the electrode connections called the cathode â€", negative , attracting positive ions e. This is quite a problem. At the high temperature of the electrolysis cell it burns and oxidises away the carbon electrodes to form toxic carbon monoxide or carbon dioxide. So the electrode is regularly replaced and the waste gases dealt with! It is a costly process 6x more than Fe! Metals and hydrogen from positive ions , form at the negative cathode electrode. Nonâ€"metals from negative ions , form at the positive anode electrode. Raw materials for the electrolysis process: Cryolite reduces the melting point of the ore and saves energy, because the ions must be free to move to carry the current Electrolysis means using d. The electrical energy splits the compound! An electrolyte is a conducting melt or solution of freely moving ions which carry the charge of the electric current. The redox details of the electrode processes: They gain three electrons to change to neutral Al atoms. They lose two electrons forming neutral oxygen molecules. Reduction and Oxidation always go together! The overall electrolytic decomposition is Any molten or dissolved material in which the liquid contains free moving ions is called the electrolyte. Ions are charged particles e. What does the complete electrical circuit consist of? There are two ion currents in the electrolyte flowing in opposite directions: O2â€" attracted to the positive anode electrode, BUT remember no electrons flow in the electrolyte, only in the graphite or metal wiring! In the above process it takes the removal of four electrons from two oxide ions to form one oxygen molecule and the gain of three electrons by each aluminium ion to form one aluminium atom. Therefore for every 12 electrons you get 3 oxygen molecules and 4 aluminium atoms formed. The properties and uses of aluminium Aluminium can be made more resistant to corrosion by a process called anodising. Iron can be made more useful by mixing it with other substances to make various types of steel. Many metals can be given a coating of a different metal to protect them or to improve their appearance. Aluminium is a reactive metal but it is resistant to corrosion. This is because aluminium reacts in air to form a layer of aluminium oxide which then protects the aluminium from further attack. This is why it appears to be less reactive than its position in the reactivity series of metals would predict. For some uses of aluminium it is desirable to increase artificially the thickness of the protective oxide layer in a process is called anodising. This involves removing the oxide layer by treating the aluminium sheet with sodium hydroxide solution. The aluminium is then placed in dilute sulphuric acid and is made the positive electrode anode used in the electrolysis of the acid. Oxygen forms on the surface of the aluminium and reacts with the aluminium metal to form a thicker protective oxide layer. More on the reactions of aluminium Reaction with aluminium with chlorine If dry chlorine gas Cl2 is passed over heated iron or aluminium, the chloride is produced. The experiment shown above should be done very carefully by the teacher in a fume cupboard. Reaction of chloride with water: With a little water it rapidly, and exothermically hydrolyses to form aluminium hydroxide and nasty fumes of hydrogen chloride gas. Theoretically its quite a reactive metal but an oxide layer is readily formed even at room temperature and this has quite an inhibiting effect on its reactivity.

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Chapter 7 : Main-group element - Wikipedia

Various forms of evidence have been put forward in support of each version of group 3, appealing to chemical as well as physical properties, spectral characteristics of the elements, and criteria concerning the electronic configurations of their atoms.

Lanthanides The main group or A-group elements occupy an important place in the world of chemistry. Eight of the 10 most abundant elements on the earth are in these groups. The main group elements and their compounds are economically important and because they have interesting chemistries. Main group elements in Group 1A and 2A are known as s-block elements and their valence electrons. Elements in the min groups at the right in the periodic table , Groups 3A through 8A are known as p-block elements. Their valence electrons include the outermost s and p electrons. Elements also can be divided into three broad categories. The set of metals in Group 3 through 12 are known as transition metals. The set of metals in rows 6 and 7 that are normally shown below the rest of the table are the lanthanides and actinides. All other elements are designated as main group elements. Main Group Elements Definition Back to Top "Each period of the periodic table begins with an element having an ns1 configuration and ends with an element having a noble gas configuration 1s2 or ns2np6. Elements with an incompletely filled set of s and p orbitals are called main group or representative elements. The ionic states and the covalent states formed by the main group elements are related directly to the electron configuration of the elements and are reasonably predictable. The list of some general information about the main group elements are given below. Group 1A elements have a relatively low ionization energy so they tend to lose their ns1 valence shell electron easily when they react, thereby adopting the electron configuration of the noble gas element in the previous row of the periodic table. Group 2A elements have relatively low first and second ionization energy so they tend to lose both their ns2 valence shell electrons easily when they react and adopt a noble gas electron configuration. Group 3A elements tend to lose all three of their ns2np2 valence shell electrons and adopt a noble gas electron configuration. Group 7A elements have a relatively large negative electron affinity so they tend to gain one electron easily when they react, changing from ns2np6 to ns2np6 and thereby adopting the configuration of the neighboring noble gas element in the same row. Group 8A elements are essentially inert and undergo very few reactions they neither gain nor lose electrons easily. The ten elements in the center of periods 4 through 6 are called transition metals they fall in Group 3 through The first transition series starts with Sc and ends with Zn. Certain main groups are given special names. The elements in Group 1 at the far left of the periodic table are called alkali metals those in Group 2 are referred to as alkaline earth metals. As we move to the right the elements in group 17 are called halogens at the far right the noble gases constitute Group Elements in the same main group show similar properties. The elements in the groups beginning are known as the representative elements or main group elements, while all the others are known as the transition elements. The main group metals periodic table is shown below. Is Lead a Main Group Element? Back to Top Yes, Lead belongs to Group 14 in the periodic table and placed in p-block elements of the main group elements. Lead occurs in the form of lead sulfide PbS known as galena. The Latin word for lead is plumbum thus its symbol Pb. The word "plumber" comes from the early use of lead water pipes and pipe joints. There are 13 elements in s-block. Group I and II belong to s-block elements. Group I elements are also called alkali metals and Group II as alkaline earth metals.

Chapter 8 : Group 2 Elements: The Alkaline Earth Metals - Chemistry LibreTexts

The Group 3 elements are chemical elements comprising the third vertical column of the periodic table.. IUPAC has not recommended a specific format for the periodic table, so different conventions are permitted and are often used for group 3.

Chapter 9 : Group 3 Elemental Properties - Chemistry LibreTexts

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Group 2: Chemical Properties of Alkali Earth Metals Covers the elements beryllium (Be), magnesium (Mg), calcium (Ca), strontium (Sr) and barium (Ba). Includes trends in atomic and physical properties, trends in reactivity, the solubility patterns in the hydroxides and sulfates, trends in the thermal decomposition of the nitrates and carbonates.