DOWNLOAD PDF ELSEVIERS PERIODIC TABLE OF THE ELEMENTS

Chapter 1 : How to Read the Periodic Table: 14 Steps (with Pictures) - wikiHow

The periodic table of the elements. The periodic table is an arrangment of the chemical elements ordered by atomic number so that periodic properties of the elements (chemical periodicity) are made clear.

Check new design of our homepage! Labeled Periodic Table of Elements with Names A labeled periodic table of elements with names, will help you to know the different elements and understand their placement in the periodic table. Read on to know more about the periodic table and its elements ScienceStruck Staff A periodic table is nothing but a systematic arrangement of the chemical elements, in a table form. This credit for this invention goes to the Russian scientist named, Dmitri Mendeleev. Since its invention, the periodic table has undergone number of changes. The periodic table is considered one of the most important reference, in studies related to chemistry. It consists of all the chemical elements known till date. Periodic Table of Elements As discussed earlier, periodic table is a tabular arrangement of all the known chemical elements. The elements are arranged from left to right, with increasing atomic number. Atomic number and atomic mass are two major properties of any chemical element. The atomic number of an element is, the number of protons present in the nucleus of the atom of the respective element, while atomic mass is the summation of proton mass, electron mass and neutron mass of an atom of the respective element. The atomic number is unique for every element. The atomic symbol is the abbreviation of the chemical element in the form of one or two letters. Many of the atomic symbols are shortened Latin names of these chemical elements. Periods and groups are two important characteristics of the periodic table. The horizontal rows of the periodic table are referred as periods, while the vertical columns are referred as groups. Groups and periods are two most important methods of classifying the elements in the periodic table. The elements present in the periodic table are classified under different groups, depending on their chemical and physical properties. They are, metalloids, alkali metals, alkaline earth metals, transition metals, other elements, non-metals, halogens, noble gases and rare earth elements. In many of the groups, the member elements have similar properties. The elements that come under metalloids group, bear the properties of both metals and non-metals. These elements are placed in group 13, 14, 15 and Alkali metals are placed in the first group of the periodic table and consist of elements Lithium, Sodium, Potassium, Rubidium, Cesium, Francium. All these elements are highly reactive and do not occur freely in nature. Even these metals do not occur freely in nature. Beryllium, Magnesium Calcium, Strontium, Barium and Radium are the six, elements that belong to this category. All the elements that are placed in groups 3 to 12 are transition metals. Ductility, malleability and conductivity of electricity, are some of the basic properties of these elements. Chromium, Copper, Nickel, Mercury, Gold and Silver are some of the metals, that belong to this group. Rare earth elements are located in the 3rd, 6th and 7th periods of the periodic table. Most of the elements that belong to this group are man- made or synthetic. Lanthanide and Actinide series together form the rare earth elements. Cerium, Curium, Europium, Uranium, etc are some of the rare earth elements. Hydrogen, Carbon, Nitrogen, Oxygen, Phosphorus, Sulfur and Selenium are seven non-metals located in the 14th, 15th and 16th group of the periodic table. These elements are very brittle and do not easily conduct electricity. Noble gases are located in 18th group of the periodic table. Given below is a labeled periodic table of elements with their names and atomic number. Hold the mouse on each atomic symbol to know the name of the chemical element.

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Chapter 2 : Kids science: Periodic Table of Elements

The periodic table of elements arranges all of the known chemical elements in an informative array. Elements are arranged from left to right and top to bottom in order of increasing atomic number.

It was not until the following century, with Gilbert N. Noble gases unknown and unpredicted. The Russian chemist Dmitri Mendeleev was the first scientist to make a periodic table similar to the one used today. The elements, if arranged according to their atomic mass, exhibit an apparent periodicity of properties. Elements which are similar as regards to their chemical properties have atomic weights which are either of nearly the same value e. The arrangement of the elements, or of groups of elements in the order of their atomic masses, corresponds to their so-called valencies, as well as, to some extent, to their distinctive chemical properties; as is apparent among other series in that of Li, Be, B, C, N, O, and F. The elements which are the most widely diffused have small atomic weights. The magnitude of the atomic weight determines the character of the element, just as the magnitude of the molecule determines the character of a compound body. We must expect the discovery of many yet unknown elements â€" for example, elements analogous to aluminium and silicon â€" whose atomic weight would be between 65 and The atomic weight of an element may sometimes be amended by a knowledge of those of its contiguous elements. Thus the atomic weight of tellurium must lie between and , and cannot be Certain characteristic properties of elements can be foretold from their atomic masses. It could be used by Mendeleev to point out that some of the atomic weights being used at the time were incorrect. It provided for variance from atomic weight order. A few months after Mendeleev published his periodic table of the known elements, predicted new elements to help complete his table and corrected the atomic weights of some of the elements, Meyer published a virtually identical periodic table. William Odling[edit] In , the English chemist William Odling also drew up a table that was remarkably similar to the table produced by Mendeleev. Time proved this audacious calculation correct. However, when this entire family of elements was discovered, William Ramsay was able to add them to the table as Group 0, without the basic concept of the periodic table being disturbed. A single position could not be assigned to hydrogen , which could be placed either in the alkali metals group, the halogens group or separately above the table between boron and carbon. Frederick Soddy in found that although they emitted different radiation, many elements were alike in their chemical characteristics so shared the same place on the table. The new order was in agreement with the chemical properties of these elements, since argon is a noble gas and potassium is an alkali metal. Similarly, Moseley placed cobalt before nickel and was able to explain that tellurium occurs before iodine , without revising the experimental atomic weight of tellurium, as had been proposed by Mendeleev. Seaborg experienced unexpected difficulties in isolating the elements americium and curium. Seaborg wondered if these elements belonged to a different series, which would explain why their chemical properties were different from what was expected. The actinide series is the second row of the f-block 5f series. In both the actinide and lanthanide series, an inner electron shell is being filled. The actinide series comprises the elements from actinium to lawrencium.

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Chapter 3 : The periodic table of the elements by WebElements

â€¢ Group: There are only 18 groups in the periodic table that constitute the columns of the table. Lanthanoids and Actinoids are numbered as and to separate them in sorting by group. â€¢ The elements marked with an asterisk (in the 2nd column) have no stable nuclides.

Elements are listed in the table by the structure of their atoms. This includes how many protons they have as well as how many electrons they have in their outer shell. From left to right and top to bottom, the elements are listed in the order of their atomic number, which is the number of protons in each atom. It is called "periodic" because elements are lined up in cycles or periods. From left to right elements are lined up in rows based on their atomic number the number of protons in their nucleus. Some columns are skipped in order for elements with the same number of valence electrons to line up on the same columns. When they are lined up this way, elements in the columns have similar properties. Each horizontal row in the table is a period. There are seven or eight total periods. The first one is short and only has two elements, hydrogen and helium. The sixth period has 32 elements. In each period the left most element has 1 electron in its outer shell and the right most element has a full shell. Groups Groups are the columns of the periodic table. There are 18 columns or groups and different groups have different properties. One example of a group is the noble or inert gases. These elements all line up in the eighteenth or last column of the periodic table. They all have a full outer shell of electrons, making them very stable they tend not to react with other elements. Another example is the alkali metals which all align on the left-most column. They are all very similar in that they have only 1 electron in their outer shell and are very reactive. You can see all the groups in the table below. This lining-up and grouping of similar elements helps chemists when working with elements. They can understand and predict how an element might react or behave in a certain situation. Element Abbreviations Each element has its own name and abbreviation in the periodic table. Some of the abbreviations are easy to remember, like H for hydrogen. Some are a bit harder like Fe for iron or Au for gold. For gold the "Au" comes from the Latin word for gold "aurum". The periodic table was proposed by Russian chemist Dmitri Mendeleev in Using the table, Mendeleev was able to accurately predict the properties of many elements before they were actually discovered. Fun facts about the Periodic Table Carbon is unique in that it is known to form up to 10 million different compounds. Carbon is important to the existence of life. Francium is the rarest element on earth. There are probably no more than a few ounces of it on earth at any given time. The only letter not in the periodic table is the letter J. The country Argentina is named after the element silver symbol Ag which is argentum in Latin. Although there is helium on Earth, it was first discovered by observing the sun. Activities Take a ten question quiz about this page. Full Periodic Table Periodic Table with detailed information click for larger view.

Chapter 4 : Alphabetical list by Name of the chemical elements of the periodic table

Periodic table of the elements, in chemistry, the organized array of all the chemical elements in order of increasing atomic numberâ€”i.e., the total number of protons in the atomic nucleus. When the chemical elements are thus arranged, there is a recurring pattern called the "periodic law" in their properties, in which elements in the same.

Chemistry in its element: Andrea Sella When I was about 12, my friends and I went through a phase of reading science fiction. There the were the fantastic worlds of Isaac Asimov, Larry Niven and Robert Heinlein, involving impossible adventures on mysterious planets - the successes of the Apollo space programme at the time only helped us suspend our disbelief. One of the themes I remember from these stories was the idea that alien life forms, often based around the element silicon, abounded elsewhere in the universe. Well, it is often said that elements close to each other in the periodic table share similar properties and so, seduced by the age-old red herring that "carbon is the element of life", the writers selected the element below it, silicon. I was reminded of these readings a couple of weeks ago when I went to see an exhibition of work by a couple of friends of mine. Called "Stone Hole" it consisted of stunning panoramic photographs taken at extremely high resolution inside sea caves in Cornwall. As we wandered through the gallery a thought occurred to me. Silicate rocks - those in which silicon is surrounded tetrahedrally by four oxygen atoms - exist in an astonishing variety, the differences being determined by how the tetrahedra building blocks link together, and what other elements are present to complete the picture. When the tetrahedra link one to the next, one gets a mad tangle of chains looking like an enormous pot of spaghetti - the sorts of structures one gets in ordinary glass. The purest of these chain-like materials is silicon dioxide - silica - found quite commonly in nature as the colourless mineral quartz or rock crystal. In good, crystalline quartz, the chains are arranged in beautiful helices and these can all spiral to the left. Or to the right. When this happens the crystals that result are exact mirror images of each other. But not superimposable - like left and right shoes. To a chemist, these crystals are chiral, a property once thought to be the exclusive property of the element carbon, and chirality, in turn, was imagined to be a fundamental feature of life itself. Yet here it is, in the cold, inorganic world of silicon. Most grandiose of all, one can make porous 3D structures - a bit like molecular honeycombs - particularly in the presence of other tetrahedral linkers based on aluminium. These spectacular materials are called the zeolites, or molecular sieves. By carefully tailoring the synthetic conditions, one can build material in which the pores and cavities have well defined sizes - now you have a material that can be used like a lobster traps, to catch molecules or ions of appropriate size. But what of the element itself? Freeing it from oxygen is tough, it hangs on like grim death and requires brutal conditions. It was Humphrey Davy, the Cornish chemist and showman, who first began to suspect that silica must be a compound, not an element. He applied electric currents to molten alkalis and salts and to his astonishment and delight, isolated some spectacularly reactive metals, including potassium. He now moved on to see what potassium could do. Passing potassium vapour over some silica he obtained a dark material that he could then burn and convert back to pure silica. Where he pushed, others followed. Dark gray in colour and with a very glossy glass-like sheen, it looks like a metal but is in fact quite a poor conductor of electricity, and there in many ways, lies the secret of its ultimate success. The problem is that electrons are trapped, a bit like pieces on a draughts board in which no spaces are free. What makes silicon, and other semiconductors, special is that it is possible to promote one of the electrons to an empty board - the conduction band - where they can move freely. Warming a semiconductor, allow some electrons to leap, like salmon, up to the empty conduction band. And at the same time, the space left behind - known as a hole - can move too. But there is another way to make silicon conduct electricity: Such tricks lie at the heart of the functioning of the silicon chips that allow you to listen to this podcast. In less than 50 years silicon has gone from being an intriguing curiosity to being one of the fundamental elements in our lives. The prospects do not seem good - silicate fibres, like those in blue asbestos are just the right size to penetrate deep inside the lungs where they pierce and slash the inner lining of the lungs. And yet, because of its extraordinary structural variability, silicon chemistry has been harnessed by biological systems. Silicate shards lurk in the spines of nettles waiting to score the soft skin of the unwary hiker and inject minuscule amounts of irritant. And in almost unimaginable numbers delicate silicate structures are grown by the many tiny life-forms that lie at the base of marine food chains, the diatoms. Could one therefore find silicon-based aliens somewhere in space? My hunch would probably be not. Certainly not as the element. It is far too reactive and one will always find it associated with oxygen. But even linked with oxygen, it seems unlikely, or at least not under the kinds of mild conditions that we find on earth. But then again, there is nothing like a surprise to make one think. It is queerer than we can suppose". I live in hope. Meera Senthilingam So although unlikely there could be some silicon based surprises lurking out in space. That was the ever hopeful Andrea Sella from University College London with the life forming chemistry of silicon. Now next week we hear about Roentgenium the element that we need to get just right. Simon Cotton The idea was to make the nickel ions penetrate the bismuth nucleus, so that the two nuclei would fuse together, making a bigger atom. The energy of the collision had to be carefully controlled, because if the nickel ions were not going fast enough, they could not overcome the repulsion between the two positive nuclei and would just fly off the bismuth on contact. However, if the nickel ions had too much energy, the resulting "compound nucleus" would have so much excess energy that it could just undergo fission and fall apart. End promo Help text not available for this section currently Video.

Chapter 5 : Silicon - Element information, properties and uses | Periodic Table

The periodic table (also known as the periodic table of elements) is organized so scientists can quickly discern the properties of individual elements such as their mass, electron number, electron configuration and their unique chemical properties.

Our design-related articles and code will evolve as we make new discoveries. With this project, you can learn how to lay out an array of objects in 3D space with various surface types using an Object collection. Also learn how to create interactable objects that respond to standard inputs from HoloLens. About the app Periodic Table of the Elements visualizes the chemical elements and each of their properties in a 3D space. It incorporates the basic interactions of HoloLens such as gaze and air tap. Users can learn about the elements with animated 3D models. Background After I first experienced HoloLens, a periodic table app was an idea I knew that I wanted to experiment with in mixed reality. Since each element has many data points that are displayed with text, I thought it would be great subject matter for exploring typographic composition in a 3D space. Design For the default view of the periodic table, I imagined three-dimensional boxes that would contain the electron model of each element. With gaze and air tap, the user could open up a detailed view of each element. To make the transition between table view and detail view smooth and natural, I made it similar to the physical interaction of a box opening in real life. Design sketches In detail view, I wanted to visualize the information of each element with beautifully rendered text in 3D space. The animated 3D electron model is displayed in the center area and can be viewed from different angles. Interaction prototypes The user can change the surface type by air tapping the buttons on the bottom of the table - they can switch between plane, cylinder, sphere and scatter. Common controls and patterns used in this app Interactable object button Interactable object is an object which can respond to basic HoloLens inputs. For example, you can make a coffee cup in your scene interactable and respond to inputs such as gaze, air tap, navigation and manipulation gestures. Learn more Object collection Object collection is an object which helps you lay out multiple objects in various shapes. It supports plane, cylinder, sphere and scatter. You can configure additional properties such as radius, number of rows and the spacing. Learn more Fitbox By default, holograms will be placed in the location where the user is gazing at the moment the application is launched. This sometimes leads to unwanted result such as holograms being placed behind a wall or in the middle of a table. A fitbox allows a user to use gaze to determine the location where the hologram will be placed. It is made with a simple PNG image texture which can be easily customized with your own images or 3D objects. Application examples Here are some ideas for what you could create by leveraging the components in this project. Stock data visualization app Using the same controls and interaction model as the Periodic Table of the Elements sample, you could build an app which visualizes stock market data. This example uses the Object collection control to lay out stock data in a spherical shape. You can imagine a detail view where additional information about each stock could be displayed in an interesting way. An example of how the Object collection used in the Periodic Table of the Elements sample app could be used in a finance app Sports app This is an example of visualizing sports data using Object collection and other components from the Periodic Table of the Elements sample app. An example of how the Object collection used in the Periodic Table of the Elements sample appcould be used in a sports app About the author.

Chapter 6 : Periodic Table of the Elements - Mixed Reality | Microsoft Docs

How To Read the Periodic Table of the Elements. Click on an element symbol to get detailed facts about each chemical element. The element symbol is a one- or two-letter abbreviation for an element's name.

The pattern of valence and the type of bondingâ€”ionic or covalentâ€”characteristic of the elements were crucial components of the evidence used by the Russian chemist Dmitri Mendeleev to compile the periodic table, in which the chemical elements are arranged in a manner thatâ€¦ History of the periodic law The early years of the 19th century witnessed a rapid development in analytical chemistryâ€”the art of distinguishing different chemical substancesâ€”and the consequent building up of a vast body of knowledge of the chemical and physical properties of both elements and compounds. This rapid expansion of chemical knowledge soon necessitated classification , for on the classification of chemical knowledge are based not only the systematized literature of chemistry but also the laboratory arts by which chemistry is passed on as a living science from one generation of chemists to another. Relationships were discerned more readily among the compounds than among the elements; it thus occurred that the classification of elements lagged many years behind that of compounds. In fact, no general agreement had been reached among chemists as to the classification of elements for nearly half a century after the systems of classification of compounds had become established in general use. Lenssen, Max von Pettenkofer, and J. Attempts were later made to show that the atomic weights of the elements could be expressed by an arithmetic function , and in A. De Chancourtois plotted the atomic weights on the surface of a cylinder with a circumference of 16 units, corresponding to the approximate atomic weight of oxygen. Classification of the elements In , J. Newlands proposed classifying the elements in the order of increasing atomic weights, the elements being assigned ordinal numbers from unity upward and divided into seven groups having properties closely related to the first seven of the elements then known: This relationship was termed the law of octaves, by analogy with the seven intervals of the musical scale. In an paper Mendeleyev presented a revision of the group table, the principal improvement being the correct repositioning of 17 elements. He, as well as Lothar Meyer , also proposed a table with eight columns obtained by splitting each of the long periods into a period of seven, an eighth group containing the three central elements such as iron , cobalt , nickel; Mendeleyev also included copper , instead of placing it in Group I , and a second period of seven. Periodic system of elements with periods demarcated by noble gases. Long-period form of periodic system of elements. Short-period form of periodic system of elements, listing the elements known by At that time it was not clear that thorium 90 , protactinium 91 , and uranium 92 were part of the actinide series, and they were often placed in groups IVa, Va, and VIa, respectively, because they showed some similarities to hafnium 72 , tantalum 73 , and tungsten Based on an earlier model of T. Thomsen in devised a new table. This was interpreted in terms of the electronic structure of atoms by Niels Bohr in In this table Figure 2 there are periods of increasing length between the noble gases; the table thus contains a period of 2 elements, two of 8 elements, two of 18 elements, one of 32 elements, and an incomplete period. The elements in each period may be connected by tie lines with one or more elements in the following period. The principal disadvantage of this table is the large space required by the period of 32 elements and the difficulty of tracing a sequence of closely similar elements. A useful compromise is to compress the period of 32 elements into 18 spaces by listing the 14 lanthanoids also called lanthanides and the 14 actinoids also called actinides in a special double row below the other periods. Other versions of the periodic table Alternate long forms of the periodic table have been proposed. One of the earliest, described by A. Werner in , divides each of the shorter periods into two parts, one at either end of the table over the elements in the longer periods that they most resemble. The multiple tie lines connecting the periods in the Bayley-type table are thus dispensed with. This class of table, too, can be greatly simplified by removing the lanthanoid and actinoid elements to a separate area. By the midth century this version of the table Figure 1 had become the most commonly used. This change indicated that there were small errors in the previously accepted atomic weights of several of the elements and large errors for several others, for which wrong multiples of the combining weights had been used as atomic weights the combining weight being that weight of an element that combines with a given weight of a standard. Mendeleyev was also able to predict the existence, and many of the properties, of the then undiscovered elements eka-boron, eka-aluminum, and eka-silicon, now identified with the elements scandium , gallium , and germanium , respectively. Similarly, after the discovery of helium and argon, the periodic law permitted the prediction of the existence of neon, krypton, xenon, and radon. Moreover, Bohr pointed out that the missing element 72 would be expected, from its position in the periodic system, to be similar to zirconium in its properties rather than to the rare earths; this observation led G. Coster in to examine zirconium ores and to discover the unknown element, which they named hafnium. Significance of atomic numbers In spite of the corrections made by the redetermination of atomic weights, some of the elements in the Mendeleyev and Lothar Meyer periodic tables of were still required by their properties to be put in positions somewhat out of the order of atomic weights. In the pairs argon and potassium, cobalt and nickel , and tellurium and iodine, for example, the first element had the greater atomic weight but the earlier position in the periodic system. The solution to this difficulty was found only when the structure of the atom was better understood. The ratio of the nuclear charge to that of the electron was noted to be roughly one-half the atomic weight. This suggestion was brilliantly confirmed in by H. There is no longer any uncertainty about the position of any element in the ordered series of the periodic system. That the exact atomic weight of an element is of small significance for its position in the periodic system is shown by the existence of isotopes of every elementâ€”atoms with the same atomic number but different atomic weights. The chemical properties of the isotopes of an element are essentially the same, and all the isotopes of an element occupy the same place in the periodic system in spite of their differences in atomic weight. Elucidation of the periodic law Detailed understanding of the periodic system has developed along with the quantum theory of spectra and the electronic structure of atoms, beginning with the work of Bohr in Important forward steps were the formulation of the general rules of the old quantum theory by William Wilson and Arnold Sommerfeld in , the discovery of the exclusion principle by Wolfgang Pauli in , the discovery of the spin of the electron by George E. The development of the electronic theory of valence and molecular structure, beginning with the postulate of the shared electron pair by Gilbert N. Lewis in , also played a very important part in explaining the periodic law see chemical bonding. The periodic table Periods The periodic table of the elements contains all of the chemical elements that have been discovered or made; they are arranged, in the order of their atomic numbers, in seven horizontal periods, with the lanthanoids lanthanum, 57, to lutetium , 71 and the actinoids actinium, 89, to lawrencium , indicated separately below unless otherwise stated, Figure 1 will be used as reference. The periods are of varying lengths. First there is the hydrogen period, consisting of the two elements hydrogen, 1, and helium, 2. Then there are two periods of eight elements each: There follow two periods of 18 elements each: The first very long period of 32 elements, from cesium , 55, to radon, 86, is condensed into 18 columns by the omission of the lanthanoids which are indicated separately below , permitting the remaining 18 elements, which are closely similar in their properties to corresponding elements of the first and second long periods, to be placed directly below these elements. The second very long period, from francium , 87, to oganesson , , is likewise condensed into 18 columns by the omission of the actinoids. Groups Classification of elements into groups The six noble gasesâ€”helium, neon, argon, krypton, xenon, and radonâ€”occur at the ends of the six completed periods and constitute the Group 18 0 group of the periodic system. It is customary to refer to horizontal series of elements in the table as periods and vertical series as groups. The 17 elements of the fourth period, from potassium, 19, to bromine, 35, are distinct in their properties and are considered to constitute Groups 1â€”17 Iaâ€”VIIa of the periodic system. The first group, the alkali metals , thereby includes, in addition to lithium and sodium, the metals from potassium down the table to francium but not the much less similar metals of Group 11 Ib; copper, etc. Also the second group, the alkaline-earth metals , is considered to include beryllium, magnesium, calcium, strontium, barium, and radium but not the elements of Group 12 IIb. The boron group includes those elements in Group 13 IIIa. The other four groups are as follows: Although hydrogen is included in Group 1 Ia , it is not closely similar to either the alkali metals or the halogens in its chemical properties. Hydrogen is, in fact, the most individualistic of the elements: It is a unique element, the only element that cannot conveniently be considered a member of a group. A number of the elements of each long period are called the transition metals. These are usually taken to be scandium, 21, to zinc , 30 the iron-group transition metals ; yttrium , 39, to cadmium , 48 the palladium-group transition metals ; and hafnium, 72, to mercury , 80 the platinum-group transition metals. Periodic trends in properties The periodicity in properties of the elements arranged in order of atomic number is strikingly shown by the consideration of the physical state of the elementary substances and such related properties as the melting point , density, and hardness. The elements of Group 18 0 are gases that are difficult to condense. The alkali metals, in Group 1 Ia , are soft metallic solids with low melting points. The alkaline-earth metals, in Group 2 IIa , are harder and have higher melting points than the adjacent alkali metals. The elements of the long periods show a gradual increase in hardness and melting point from the beginning alkali metals to near the centre of the period and then at Group 16 VIb an irregular decrease to the halogens and noble gases. The valence of the elements that is, the number of bonds formed with a standard element is closely correlated with position in the periodic table, the elements in the main groups having maximum positive valence, or oxidation number, equal to the group number and maximum negative valence equal to the difference between eight and the group number. The general chemical properties described as metallic or base forming, metalloid or amphoteric, and nonmetallic or acid forming are correlated with the periodic table in a simple way: The metalloids are adjacent to a diagonal line from boron to polonium. A closely related property is electronegativity , the tendency of atoms to retain their electrons and to attract additional electrons. The degree of electronegativity of an element is shown by ionization potential , electron affinity , oxidation-reduction potential , the energy of formation of chemical bonds, and other properties. The sizes of atoms of elements vary regularly throughout the periodic system. Thus, the effective bonding radius or one-half the distance between adjacent atoms in the elementary substances in their crystalline or molecular forms decreases through the first short period from 1. The behaviour through the long periods is more complex: The sizes of atoms are of importance in the determination of coordination number that is, the number of groups attached to the central atom in a compound and hence in the composition of compounds. The increase in atomic size from the upper right corner of the periodic table to the lower left corner is reflected in the formulas of the oxygen acids of the elements in their highest states of oxidation. The smallest atoms group only three oxygen atoms about themselves; the next larger atoms, which coordinate a tetrahedron of four oxygen atoms, are in a diagonal belt; and the still larger atoms, which form octahedral oxygen complexes stannic acid, antimonic acid, telluric acid, paraperiodic acid , lie below and to the left of this belt. Only the chemical and physical properties of the elements are determined by the extranuclear electronic structure; these properties show the periodicity described in the periodic law. The properties of the atomic nuclei themselves, such as the magnitude of the packing fraction and the power of entering into nuclear reactions, are, although dependent upon the atomic number, not dependent in the same periodic way. Page 1 of 2.

Chapter 7 : The periodic table - classification of elements (video) | Khan Academy

Chemical elements listed by atomic number The elements of the periodic table sorted by atomic number. click on any element's name for further chemical properties, environmental data or health effects.

Chapter 8 : The chemical elements of the periodic table sorted by atomic number

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Chapter 9 : Periodic table of elements

Read the periodic table from top left to bottom right. The elements are ordered by their atomic numbers, which increase as you move across and down the periodic table. The atomic number is how many protons the element's atom possesses.