

Chemical and physical characteristics of Silica/Quartz

Tereza Azevedo, Investigadora da Faculdade de Ciências da Universidade de Lisboa
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Discovery and purification of silicon has a long history since Lavoisier, in 1787, thought that silica could be the possible oxide of a fundamental chemical element. In 1811, impure amorphous silicon was prepared by Gay-Lussac and Thénard, through the heating of recently isolated potassium metal with silicon tetrafluoride, but without purify nor identify it as a new element. In 1823, Jacob Berzelius, using approximately the same method as Gay-Lussac, also prepared amorphous silicon, but purifying the product to a brown powder by repeatedly washing it. For this reason he has the credit for the element's discovery. But only 31 years later, Deville prepared silicon in its more common crystalline form and in 1854 he was able to obtain a slightly impure allotrope by electrolyzing impure sodium-aluminium chloride containing approximately 10% silicon.

After oxygen, silicon is the more abundant element in the earth crust (26 to 28% by mass), but very rarely occurs as the pure free element in nature. It's known that the more abundant structural type where silicon occurs, is the silica tetrahedron, (SiO_4), the building stone of the biggest part of all the minerals under the form of complex silicate minerals, which are present in almost all types of rocks, and less often as silicon dioxide (silica, a major component of common sand). Examples of silicate minerals in the crust include those in the pyroxene, amphibole, mica, and feldspar groups. Less pure silica forms the natural glass obsidian.

In the universe only one atom of silicon exists to 30 000 atoms of hydrogen. It is present in the sun and stars and is a principal component of a class of meteorites known as stony meteorites, and is a component of tektites, a silicate mineral of possibly lunar origin,

Silicate minerals represent about 90% of all the lithosphere. Silica occurs mainly in the form of feldspar but many other crystalline forms do exist, as quartz, the silicon dioxide. Granite, quartzite, trachyte, sands and sandstones, are the main rocks composed of silica.

Silicon is essential to plant and animal life. In the seawater its concentration is quite low (3 mg of silicon/l) but many sea microorganisms as sea sponges as well as diatoms and radiolaria secrete skeletal structures made of silica, mainly in the zones of the ocean where upwelling currents are abundant. There, the cool deep sea waters rich in nutrients, as silicic acid liberated during the decomposition of sinking organic matter, are carried to the surface allowing phytoplankton extracting silicon to use as a component of their cell walls. Silica is often deposited in plant tissues, such as in the bark and wood of Chrysobalanaceae and the silica cells and silicified trichomes of *Cannabis sativa*, horsetails and many grasses.

Silicon has a particular relationship to water. When finely dispersed it is able to absorb enormous quantities of water: One mole of silicon will absorb the incredible amount of 330 moles of water. It means that 1 g of silicon is capable of absorbing approximately 100 gm of water or, one hundred times its weight. The result is organized, structured water, crystalized or semi-crystalized, water that "has form. This can be seen in the vitreous body of the eye that is such or-rganized, structured water. In fact, all water in the human organism is of that kind. Swelling and gelling processes occur everywhere, and it always means water and silicon. In the plants, mainly in

grass, for instance, small crystals of silica are responsible for the sharp character of the limbs where it is mainly stored.

Because quartz is the last mineral forming in the fractionated crystallization in the magmatic chambers, at the lowest temperatures (600°), it is more resistant to the weathering, more stable and harder (degree 7 of the Mohs scale) than the other minerals. Associated to a molecule of carbon it gives place to one of the hardest substances, the silicon carbide which structure, in which concerns de hardness, is similar to that of diamond, reaching 9 to 10 in the Mohs scale. The periodic system shows silicon and carbon to have a certain similarity, as they are closely related chemically.

As hundreds of minerals, quartz is a Diamagnetic mineral, that is, when it is submitted to a magnetic field, a weak magnetization appears, which has the opposite direction of the applicate field. This induced magnetization disappears when the field is retired. This means that the magnetic susceptibility is weak, negative and reversible.

Quartz has very particular characteristics from different points of view. Crystals which have no symmetry centre, show a property named piezoelectricity, which in quartz is quite intense. A mechanical deformation applied to a quartz blade generates its electrical polarization. This behavior is named piezoelectric effect allowing it to be employed in hundreds of applications since ever and each year even more are discovered. Because of its numerous uses quartz has been called the "Universal Crystal".

In fact, quartz crystals can change their form and curvature when an electrical charge is applied. When form changes, mainly through compression, the crystal produces an electric charge that travel all over its surface. An example is the gas lighter which, when a quick pressing is applied, creates a thousand volts charge generating a spark strong enough to light the gas. In the inverse sense, if two poles of an electrical field are applied in both opposite faces of the slab, this will suffer a deformation. In a certain frequency of the electric field the blade will produce ultra-sounds, which can be applied in the sonar construction.

When quartz crystals are electronically "excited" they produce microwaves or radio waves with a very high frequency. A very narrow beam, named maser or "microwave amplification by the stimulated emission of radiation" can go out from the crystals, at regular intervals and under specific conditions. The difference between maser and laser is in that while a laser is a directed energy tool or weapon based on "light amplification by the stimulated emission of radiation", a maser instead uses microwave amplification, or electromagnetic fields instead of coherent light beams, to produce similar results.

Another effect even more important of the quartz crystals piezoelectricity is the Resonance. If the crystal is under tension when the charge is applied, it will expand or bend, going back to its initial position and producing an opposite charge. If the initial charge is maintained it will expand again generating an electronic as well as mechanical resonance which will repeat alternately and incessantly.

Silicon has a very important interest in the production of basic material for transistors chips, solar cellules, weaponry, computation devices, civil construction, aero spatial, electric, electronic and microelectronic materials, electro domestic, medical equipment, metallurgy, optical, chemical, telecommunications, solar panels, watches, lighters, motor vehicle industry, etc. Silicon is also an important ingredient in steel.

For all these reasons the region of the USA (California) where several electronic and informatics enterprises are concentrated is called Silicon Valley.

Mystic significance of silica/quartz

The silicate group, includes a big variety of precious and half precious stones as tourmaline, onyx, topaz, amethyst, opal, garnet, sapphire, emerald, ruby, chalcedony, jasper, agate, etc, all used as magic materials since thousands of years ago.

Power of crystals and of quartz in particular, is recognized since immemorial times, namely in Egyptian culture, where they were used in healing and harmonization of the physical and energetic body, giving physical, mental and spiritual equilibrium. Registers tell that also in Greek and Indian, quartz crystals entered in the composition of elixirs applied as a cure method and they were used as common healing in medicine.

For ancient Japanese it represented perfection and they believed it was formed from the breath of a white dragon. Australian Aborigines used quartz in rain rituals. Spheres of clear quartz have been used as crystal balls to predict the future at least since the middle ages.

The power of the quartz crystals is known as having a high frequency vibrational energy which can be directed to the points of energetic deficit on the human body. According to the color and size they have a specific function. Nowadays, their power is still recognized even if the official medicine doesn't approve it.

The structure of silica is organized in hexagons and can be represented by 2x3, or two triangles, being the number six related with cosmic forces. The two triangles of the hexagon (six) is the image representing spiritual entities, creative spirits accurately described in the Bible as the Elohim. The term may be translated as 'God', or "gods" whose creative activity is in the sphere of light. We find them in the light and, on earth, in plants, humans, and silica, for instance.

Much more was known in the past when people were aware of the significance of numbers. In Hebrew, every letter of the alphabet has its numerical correspondent starting by the greatest, there is, the number One. One, the first letter of the Hebrew alphabet. One-ness, Unity, is the beginning of everything.

"Cosmic light forces come to an end in silica on earth. Silica is thus the vessel or mediator of cosmic light forces. In its purest form, as rock crystal, it is pervious to light, though one might also say it is pervious to cosmic forces". Silica channels cosmic energy.

According to Rudolph Steiner, the father of the Anthroposophy:

"Everything that lives in the siliceous nature contains forces which come not from the earth, but from the so called distant planets, the planets beyond the Sun- Mars, Jupiter and Saturn". Silica is the conduit through which the forces of the distant planets work. (*Thérapeutique et Science Spirituelle*-Steiner, R, 1980 3rded. Genève Switzerland)

He dedicates a whole chapter of one of his books just describing the importance of silica in the formation of the human body, mainly of the head. Because silica is responsible for the organizing principle behind it, the younger an organism is, the more silica does it contain.

The same can be said about water since human beings originally consist of water giving sense to the idea that we have our origin on water. But that water must be highly organized otherwise the form could not enter into it. It is silica that allows the presence of form starting by the periphery. Organs with the highest silica levels are the skin, nails, hair, and the connective tissue that is present in all parts of the organism. The form is thus given to the embryo from the outside, the skin enveloping it having the highest silica content of the entire environment.

Steiner implemented a new and revolutionary way of making agriculture, called biodynamic, just using quartz properties. His method is improved and gives extraordinary results. Biodynamics is then, an agricultural method

developed from indications given in 1924 by this doctor, that employs what is described as " a holistic understanding of agricultural processes". It laid the foundation for a new way of thinking about the relationship of the Earth and the formative forces of Nature.

Biodynamics, characterized as "spiritual science", is both practiced and taught, bringing health and wholeness to the land and the community and became the first organized organic approach to farming. It treats soil fertility, plant growth, and livestock care as ecologically interrelated tasks, emphasizing spiritual and mystical perspectives.

Even if the methods are controversial and critics have characterized biodynamic agriculture as pseudoscience on the basis of a lack of strong evidence for its efficacy and skepticism about aspects criticized as being magical thinking, biodynamic techniques were used on 142,482 hectares in 47 countries (2011 data). Germany accounts for 45% of the global total the remainder average 1750 ha per country.

One of the most famous method of Biodynamic agriculture is just the use of preparations such as burying ground quartz stuffed into the horn of a cow, which are said to harvest "cosmic forces in the soil", that are more akin to sympathetic magic than agronomy.

Steiner says:

..."all quartz rocks are like eyes through which the Earth can see into the Cosmos. We are reminded of the many- faceted eyes of insects which divide into numbers of parts whatever comes toward them from the outside. We should, and indeed must, picture innumerable quartz and similar formations on the surface of the Earth as being eyes enabling the Earth inwardly to reflect and indeed inwardly perceive the cosmic environment. And gradually the knowledge dawns in us that every crystal formation present in the Earth is a sense organ for perceiving the Cosmos."(Rudolf Steiner, Mystery, Knowledge and Mystery Centers). (This property of quartz seems to have it's origin just in Resonance effect).

And in June 7, 1924 at Count Keyserlinck's estate in Koberwitz, Dr. Steiner said:

"On the other hand, when plants evolve in such a way that they become food for humans and animals, then Mars, Jupiter and Saturn, working via the siliceous nature, are involved in the process. The siliceous nature opens the plant being to the wide spaces of the Universe and awakens the sense of the plant in such a way as to perceive from all quarters of the universe the forces which are molded by these distant planets. Whenever this occurs, Mars, Jupiter and Saturn are playing their part. From the sphere of the Moon, Venus and Mercury, on the other hand, is received all that which makes plants capable of reproduction."

A quartz crystal is a kind of accumulator of energy. It can absorb, store, project, dissipate and focalize subtle energies. Silica can transmit more than 95% of the wave length of the infrared radiations. Its molecular structure is geometrically perfect and it is sensitive to a wide range of waves processing and emitting energy in frequencies imperceptible to human been. Its different varieties are used in crystal therapy in order to confer and stimulate energies or to protect against those that must be prevented.

Quartz is also an excellent all-purpose crystal healer stone, dispelling negativity and clearing away negative energy being considered a Master Healer stone. It is said to amplify healing energy and is used to perform diagnostic healing. Quartz crystals have a high frequency vibrational energy and are used in several treatments and therapies as color therapy. Each crystal has a specific function according to its color and size.

A personal quartz crystal can protect as a powerful instrument of psychic defense. Kirlian photos shows that the human bio magnetic field doubles

when one handle a quartz crystal and it grows over time till a point in which it enters in resonance with the energetic pattern of the body providing lightness, harmony and balance.

This is only a little abstract about silicon properties. Over the last centuries several famous scientists have made amazing discoveries. Between them was Marcel Vogel, one of the most prolific scientists in IBM history with over 100 patents in his name practiced along 27 years, as the invention of the magnetic coating for the 24" hard disc drive systems. In the 1970's his pioneering work in man-plant communication experiments led him to the study of quartz crystals. After trying several shapes (single terminated, double terminated, four-sided, six-sided, six-sided with four-sided terminations, eight-sided with four-sided terminations and so on) and in the measure he understood more about the relation with the geometry of the Tree of Life, he was then able to grind the quartz with greater specificity into the required shape. From continual experimentation came the first fundamental instrument for storing, amplifying, transferring and cohering the energies of the body mind of an individual: a four sided faceted quartz crystal with pyramidal terminations which is three dimensional representation of the Tree of Life. The more acute termination is called the "firing tip" as this is the end of the crystal from which the coherent field is emitted. A crystal must be faceted not only with geometrical precision along the "C" or growth axis, . These crystals have come to be known as Vogel-cut® crystals. But it is not simply a matter of mechanically cutting the same general shape. Some of the reputedly best crystal and diamond cutters in Germany have attempted to reproduce the Vogel-cut® crystals with no success.

One of the most important researches in the application of quartz crystals was the relationship between quartz and water. The fundamental geometrical pattern of quartz and water is the tetrahedron. With the Vogel-cut® crystals he could structured the water by spinning it around a tuned crystal, altering many of the characteristics of the water and converting it into an information storage system*. Structured water has a greater degree of bonding between adjacent water molecules than does unstructured water by forming a crystalline-like structure consisting of elongated chains of molecules that can be differentiated from the surrounding water molecules by qualities that are consistent with qualities found in liquid crystals such as increased birefringence and a lowering of the freezing point.

Although the extraordinary importance of his work and the incredible experiences he did, researching the amazing possibilities and potentialities and extraordinary energies of this mineral, its name is almost unknown of the academic community.

After describing some of the numerous extraordinary properties of silica it seems obvious and understandable that our ancestors choose the enriched silica rocks to build their sacred places. They knew all its potentialities and could use it to fertilize the soils, to cure illnesses, to connect with the stars and gods, to orient the soul in its path in direction of eternity...

Quartz is no doubt the most fascinating mineral on the planet as water is the most fabulous liquid...

Vogel-cut® crystal