

Lapis Lazuli

By Leslie Malakowsky

This article was inspired by a polished specimen that an HGMS member brought to “show-and-tell” night!

Lapis lazuli (/ˈlæpɪs ˈlæzjuːli/), or lapis for short, is a semi-precious stone prized since antiquity for its intense deep blue color.



Lapis is a rock that consists of a mixture of minerals. An essential component mineral is lazurite, a *feldspathoid* and a member of the sodalite group of silicate minerals with the formula $\text{Na}_3\text{Ca}(\text{Si}_3\text{Al}_3)\text{O}_{12}\text{S}$. (Feldspathoids are a group of tectosilicate minerals that resemble feldspars but have a different structure and much lower silica content.) But the species lazurite is ultra-rare and there are no known specimens of pure lazurite.



All occurrences of lapis consist of additional feldspathoids such as hauyne, vladimirivanovite, and afghanite. Some samples can also consist of other silicates such as augite, diopside and enstatite. But the most common mineral component is hauyne, a sulphur-rich member of the sodalite group with the formula $\text{Na}_3\text{Ca}(\text{Si}_3\text{Al}_3)\text{O}_{12}(\text{SO}_4)$.

Sulphur is the chemical that causes lapis' deep blue color. Most lapis also contains (in varying amounts) calcite (white), sodalite (blue), and pyrite (metallic yellow).

The variety known as “denim lapis” has an even distribution of calcite that causes the blue color to resemble denim fabric. The variety known as “Chilean lapis” is flecked with golden pyrite.

Lapis is a rock, so there's no crystal system, but lazurite frequently occurs as dodecahedra. Other physical properties are: crystal habit: compact/massive; fracture: irregular/uneven/conchoidal; hardness: 5 – 5.5 on Moh's scale; luster: dull/sub-vitreous/greasy; transparency: opaque; streak: light blue; specific gravity: 2.7 – 2.9; refractive index: 1.5. Lapis also takes an excellent polish.



Lapis usually occurs in crystalline marble as a result of *contact* metamorphism. Marble is metamorphosed limestone that consists of recrystallized carbonate minerals such as calcite or dolomite. Contact metamorphism typically occurs around new igneous rocks as they intrude into cooler native rock.



Historically, the name “lapis lazuli” was used to describe hauyne and the rock that consists predominantly of hauyne plus calcite, sodalite, and pyrite. Today, the name is used to describe the material that we use as a decorative stone rather than its mineral content.

Through time, the name has come to be associated with the stone’s blue color, and the word for blue in many languages is derived from this name. For example, *azure* (English), *azur* (French), *azzurro* (Italian), *lazur* (Polish), *azur* and *azuriu* (Romanian), *azul* (Portuguese and Spanish), and *azúr* (Hungarian). *Lapis* is the Latin word for “stone”.

Lazuli is from the Medieval Latin word *lazulum*. *Lazulum* comes from the Persian word *lājawardis*, meaning “blue”. It is also the name of a place where lapis lazuli was mined in Persia.

The earliest *published* use of the name is in *The History of Gems and Stones*, published in 1609. This book was one of the most influential texts on minerals in the seventeenth century. The author, Anselmus Boetius de Boodt, a Flemish mineralogist and naturalist, was an avid mineral collector whose travels to various mining regions in Europe formed the basis of his book. (De Boodt, who with German-born Georgius Agricola, was responsible for establishing modern mineralogy.)



Lapis was mined for 6,000 years from limestone caves in Sar-e-Sang in the Kokcha River valley of the Hindu Kush Mountains in Northeast Afghanistan. It spread throughout the prehistoric world through trade. Lapis beads have been found at Neolithic burials in Mehrgarh, the Caucasus and Mauritania. Lapis was highly valued by the Indus Valley Civilization, the ancient Egyptians and Mesopotamians, and the later Greeks and Romans.

In ancient Egypt, lapis was a favorite stone of royalty made into amulets and ornaments such as scarabs. It was used to decorate the funeral mask of the Egyptian pharaoh Tutankhamun (1341–23 BC). At the end of the Middle Ages, lapis lazuli was exported to Europe, where it was ground into powder and made into ultramarine, the finest and most expensive blue pigment of the time. Ultramarine was used in frescoes and oil paintings by some of the most important artists of the Renaissance and Baroque periods, including Masaccio, Perugino, Titian and Vermeer. They often reserved ultramarine for the clothing of their central figures, especially the Virgin Mary. This practice ended in the early 19th century when a synthetic variety of ultramarine became available.



Today, mines in Northeast Afghanistan are still a major source of lapis. Additional major sources are Pakistan, Russia (West of Lake Baikal) and Chile (in the Andes mountains). Lesser sources are Angola, Argentina, Burma, Canada, India, Italy, Mongolia and the United States (California and Colorado).



Lapis is popular for making jewelry (cabochons, pendants, beads and inlay) and decorative items such as carvings, boxes, small statues and vases. It is also commercially synthesized to make ultramarine and hydrous zinc phosphates (a commonly used corrosion inhibitor). Sometimes spinel, sodalite, or dyed jasper or howlite are substituted.

References: Wikipedia, *mindat.org*

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Editor's Note: Additional photos have been added to the original article.

The Blue Flame



Lapis lazuli, characterized by its intense blue color, has been valued as an ornamental stone and pigment for more than 6,000 years.

The name is derived from the Persian word, *lazward*, meaning “blue.”

Like most of the world’s lapis lazuli, this “Blue Flame” was mined high in a remote valley of Afghanistan’s Hindu Kush Mountains and shipped out on the back of a mule. It was a gift of Ms. Jane Mitchell and Jeffrey Bland in 2015.

Weighing over 250 pounds, it is one of the largest and finest known pieces of gem-quality lapis lazuli.

Photo courtesy Lichtblick Fotodesign, Jürgen & Hiltrud Cullmann, Schwollen, Germany. Courtesy of Henn GmbH

Sources:

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