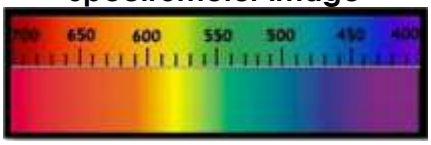
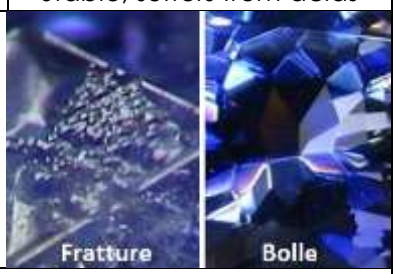
Warning : this one version was _ completed with Google Translate, for sure contains errors or inaccuracies .

Technical data sheet – general: Benitoite

<table>
<tr><td>Gemma – names</td><td>(Italian - Benitoite)
(English - Benitoite)
(French - Benitoite)
(Spanish - Benitoita)
(Portuguese - Benitoite)
(Thai - เบนิโทไอต์ (Benitoite))</td><td>(German - Benitoit)
(Arabic - بينيتوئيت (Benitoit))
(Russian - бенитоит (Benitoit))
(Mandarin – 班尼托石 (Bānnítuō shí))
(Swahili - Benitoite)
(Hindi - बेनिटोइट (Benitoit))</td><td rowspan="2">photo
  </td></tr>
<tr><td>Colors (GIA)</td><td colspan="2">Benitoite is generally blue in color, often with a purplish tinge.
Popular colors include:
Intense blue : The most precious variety.
Light Blue : Less intense but still attractive.
Purplish blue : A shade that combines blue with purple.
Rarely colorless or even pink.</td></tr>
<tr><td>Cause of Color</td><td colspan="3">Benitoite owes its color to the titanium present in its crystalline structure.
Idiochromatic Gem</td></tr>
<tr><td>Classification</td><td>Mineral class
Cyclosilicates</td><td>Species – Group (mineral)
Benitoite - //</td><td>Variety
-</td></tr>
<tr><td rowspan="2">Optical properties</td><td>Specific Gravity:
3.60-3.80
Municipality: 3.65</td><td colspan="2">RI: 1755-1805
Polariscope: : DR
Birefringence: 0.047 (high)</td><td>Character optical
Uniaxial
Pleochroism
Weakly dichroic: limited variation of blue</td></tr>
<tr><td colspan="2">Luster (luster) – luster of the fracture
Vitreous/adamantine - vitreous</td><td>Dispersion (fire)
0.046</td></tr>
<tr><td>Light</td><td colspan="2">Fluorescence
SWUV (254 nm) : intense blue
LWUV (365nm) : intense blue</td><td>Phosphorescence
Some specimens</td></tr>
<tr><td>Form</td><td>Crystalline dress
Ditrigonal bipyramidal
Melting point: NA</td><td>Phenomenal optical effects
NO</td><td>Crystalline system
Hexagonal
Crystal class</td></tr>
<tr><td>Chemical formula</td><td colspan="2">Barium titanium cyclosilicate
$BaTi(Si_3O_9)$</td><td>Spectrometer image
 
Not available</td></tr>
<tr><td>Fracture</td><td>Flaking
None evident</td><td>Breakup- Parting
. None evident</td><td>Fracture
Conchoidal</td></tr>
<tr><td>Durability</td><td>Hardness (Mohs) - Absolute
6.0-6.5, ; 72-86</td><td>Toughness
Moderate</td><td>Stability (heat, light, chemicals)
Stable, suffers from acids</td></tr>
<tr><td rowspan="2">Clarity - characteristics</td><td colspan="2">Typical inclusions that may be found in benitoite include: Gas bubbles, Small internal fractures, Inclusion minerals such as diopside, natrolite and joaquinite , Traces of fluids, These inclusions are common in benitoite crystals and can vary in size and visibility. Despite the presence of such inclusions, benitoite remains a highly sought-after mineral for its rare beauty and distinctive color.</td><td> 
</td></tr>
<tr><td>Type II
Generally included</td><td colspan="2">Transparency (commercial) - diaphanity
From transparent to translucent</td></tr>
<tr><td>Deposits - types of rocks</td><td colspan="3">Benitoite, a rare and precious mineral, is formed mainly in metasomatic deposits, typical of high pressure and low temperature environments , such as those of subduction zones . This gem is often associated with serpentinite rocks and crystallizes in cracks and fractures of the host rocks. It is found in the company of minerals such as neptunite, joaquinite, diopside and natrolite. The most famous deposit of benitoite is located in San Benito County, California, making this stone a symbol of the state. Its unique formation in geological conditions It is often found in combination with neptunite, natrolite,</td></tr>
</table>

	joaquinite, serpentine and albite . This benitoite gemstone combination set makes it a very rare and beautiful piece. **Geological age** : 23-5 million years ago.
Characteristics of rough stones	Crystals typically occur in **tabular or bipyramidal shapes** , displaying the classic hexagonal crystalline habit. Their size can vary, with some crystals reaching appreciable sizes, but many tend to be quite small. Benitoite exhibits a vibrant blue color, which is one of its most fascinating characteristics, with shades ranging from light blue to deep, saturated blue. This vibrant color, along with its high dispersion, gives raw benitoite crystals a bright, sparkling appearance, especially noticeable under a direct light source. The transparency of the crystals varies from transparent to semi-transparent, further contributing to their charm and making benitoite a highly sought-after gem among collectors and gemology enthusiasts.
Main depots	Benitoite, one of the rarest and most sought after gems, is known primarily from its deposits in San Benito County, California, USA, where it was first discovered. This location remains the most significant deposit in the world, being the only place where benitoite is found in quality and quantity suitable for gemology. Although small benitoite crystals have also been found in the **Diablo Range of California and Arkansas, USA,** as well as in Japan, none of these deposits match the quality and size of the crystals found at San Benito. The rarity and uniqueness of benitoite, together with its charm and beauty, make it an extremely precious mineral and a distinctive symbol of gemology in California. **Other deposits:** Small benitoite crystals have also been reported in Japan, but, similar to Arkansas, they are not known to be of gemological quality.
Year of discovery	**1907:** This gem was first discovered in 1907.
History	Benitoite was first discovered in **1907** by James M. Couch, near the San Benito River in California. Couch initially mistook the mineral for sapphire due to its blue color. Identification as a New Mineral Species (**1909**): After a series of analyses, benitoite was recognized as a new mineral species in 1909 by George D. Louderback, a geologist at the University of California, who named it in honor of San Benito County where it was found. After peak production in the **first half of the 20th century** , mining activity declined due to the depletion of easily accessible resources and the increasing rarity of benitoite. **From the 1960s** onwards, benitoite mining became increasingly limited. In more recent years, the Benitoite Gem Mine has been opened primarily for tourism and mineral collector activities, rather than for widespread commercial mining. Therefore, while the mine ceased operations as a major source of gemological-grade benitoite many years ago, there is no firm date for an "official" closure. Benitoite was declared a state stone of **California** in **1985** due to its exclusivity and beauty. Its presence is limited to a few locations in the world, making it one of the rarest and most sought after gems by collectors. **Name** : The name "benitoite" comes from **San Benito County** , California, USA, where it was first discovered. **Other trade names:** **Variety** : /
Attributed properties	This stone is associated with the ability to **improve intuition and communication** , it could be particularly similar to the signs that enhance these qualities, such as Gemini, Libra and Aquarius. This gemstone has, according to some, a positive energy that stimulates **the growth of joy** and happiness and expands your consciousness. Its energy creates a highly beneficial result that can stimulate psychic abilities. It helps the flow of **telepathic gifts come to life** , especially between you and someone with whom you have a close relationship. The vibration of these rare stones can help you be aware **of coincidences that occur in your life** . They might also trigger an **increase in synchronic events** and help you see the deeper meaning of what you are experiencing. **Planet:** Mercury **Month:** NA **Zodiac sign:** Virgo (and others) **Chakras:** Third Eye and Throat
Treatments	Benitoite is a gemstone that generally does not undergo treatments to improve its color or clarity, unlike other gemstones.
Synthetic counterpart	There is no synthetic counterpart used commercially.

May be confused with	Benitoite can be imitated by other materials, but due to its rarity and unique characteristics, imitations are not common. Materials such as **colored glass, cubic zirconia** or other blue minerals could be used to imitate it, but they differ significantly in terms of physical and optical properties.		
Indicative gemological tests	**Visual Test** : It stands out for its unique blue color and the brilliance given by its high dispersion. Particular crystalline shapes are useful for its identification. **Refractive Index (RI)** : It has a high RI, varying between 1.757 and 1.804, which can be measured with a refractometer to confirm its identity. **Birefringence** : It has a birefringence of approximately 0.047, observable under the gemological microscope. **Pleochroism** : Shows weak pleochroism, detectable with a dichroscope. **Spectroscopy** : Benitoite can exhibit characteristic spectral lines in spectroscopic examinations. **Hardness Test** : With a hardness of 6-6.5 on the Mohs scale, it differs from harder blue minerals such as sapphire. **Fluorescence** : Exhibits strong blue fluorescence under short-wave UV light, a key diagnostic feature.		
Value (2021)	**High :** 5000+ $/ct **3 carats+**	**Medium:** 2000 $/ct **1-3 carats**	**Low:** $1600/ct **under the carat**
Typical cut	Given the rarity of this gem, the cut follows		
Famous stones	The " **Dallas Gem " is a 7.8-carat** benitoite with an intense color. Although there are not many specific benitoite specimens with famous names as there are some diamonds or other notable gems, benitoite specimen crystals are preserved in museums and private collections around the world. These include exceptional specimens displayed at institutions such as the **Los Angeles Museum of Natural History and the Smithsonian Institution.**		
Record stones	The largest benitoite ever found weighed **93.6 carats** . Another of the largest benitoite crystals ever found measured approximately **6.2 centimeters** . This crystal, known for its exceptional size and quality, is a rare specimen, considering that most benitoite crystals are much smaller, often only a few millimeters in length.		