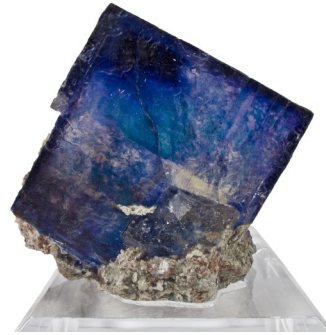


## Case 4: Blue Minerals

### Highlights of this case include:

- Large, crystalline kyanite
- Rare blue halite
- Vibrant, large opal
- Deep blue azurite



### What makes minerals blue?

Blue minerals owe their pigmentation to a number of different sources. For instance, blue copper minerals like azurite and chrysocolla get their blue color from the oxidized copper (II) in their chemical structure.

Tanzanite (a variety of the mineral zoisite) gets its deep blue color from trace amounts of vanadium. Blue halite gets its rare color either from being exposed to ionizing radiation or from trace inclusions of potassium.

Other times, the color is due to the way a mineral's structure interacts with light. For instance, labradorite is famous for its blue-iridescent "labradorescence" which occurs due to the geometric arrangement of its crystals.

### What are blue minerals used for?

- Tanzanite and opal are common gemstones.
- Kyanite is used in ceramic manufacturing and glazing.
- Labradorite is commonly found in stone countertops.
- Azurite has been used as a blue pigment in art for hundreds of years.
- Celestite is used to give fireworks a red color.
- Fluorite can come in many colors but is a major source of fluorine, used in manufacturing for everything from cooking utensils to high-octane fuels.



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**Images:**

- 1. Halite** Intrepid Potash Mine; Carlsbad Potash, New Mexico
- 2. Kyanite** Sao Jose do Safira; Minas Gerais, Brazil
- 3. Celestite** Majunga; Madagascar

**Information from:**

**Mindat.org** – The world’s largest online mineral database.

**“Rock and Gem: The definitive guide to rocks, minerals, gemstones, and fossils”** by Bonewitz, R. and the Smithsonian Institute, New York, NY: Dorling Kindersle. 2008.

**“Simon and Schuster's Guide to Rocks and Minerals”** – edited by Martin Prinz, George Harlow, and Joseph Peters. New York: Simon and Schuster, 1978.

\*available for reference in the Dice Mineralogical Museum

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