Module B. Colour from the Cosmos

Lesson 12: Colour, Light and Optics 1

Pleochroism

Some minerals will display different colours (or saturation of colours) depending on the crystallographic direction of the stone being viewed. This effect is called pleochroism and is caused by differential absorption of light according to orientation of the crystal - it is best viewed using a simple tool called a dichroscope. Tanzanite is an excellent example of a pleochroic mineral and displays three colours (often brown, purple, and blue) that align with the three different crystal axes. Iolite (the gem variety of cordierite, page 287 of your textbook) is another example. Its pleochroic colours are typically violet-blue and colourless.

An interesting tidbit here is that Viking mariners may have used the pleochroic or birefringent nature of iolite or calcite to aid in ocean navigation. The optical properties and resulting effects of these minerals would have facilitated the location of the position of the Sun in overcast skies or when the Sun was very low on the horizon.

For a fun read, try "[Viking Navigation Using the Sunstone](https://connect.ubc.ca/bbcswebdav/pid-2559975-dt-content-rid-10494281_1/courses/SIS.UBC.EOSC.118.99C.2014WC.44220/Course_Files/moduleB/lesson12/download/Iceland-Spar-and-Navigation.pdf)" by Leif Karlsen and published in Navigator's Newsletter. Other interesting information can be found on the following websites: [Secrets of the Viking Navigators](http://www.oneearthpress.com/) and [The Viking Sunstone: Is the legend of the Sunstone true?](http://www.polarization.com/viking/viking.html)