Bruce Dice
MINERALOGICAL MUSEUM

Mineral Spotlight: Kyanite

On cloudy fall days, sometimes it helps to dream of a sky-blue mineral – this week's mineral is kyanite! Kyanite is a mineral that can only form at specific temperatures and pressures, meaning it is almost always found in metamorphic rocks.

Kyanite is a sort of triplet. There are two other metamorphic minerals that have the exact same chemical composition (Al_2SiO_5), but differing crystal structures. Mineralogists call these mineral twins or triplets "polymorphs". Kyanite is a polymorph of andalusite and sillimanite. These polymorph triplets (kyanite, andalusite, and sillimanite) can be especially helpful to metamorphic geologists because they each form at specific and traceable temperatures and pressures. If a geologist finds a rock with kyanite and not andalusite or sillimanite, assumptions can be made about the relative temperature and pressure in which that rock formed. Kyanite happens to be the higher pressure, lower temperature polymorph (andalusite is high temperature, lower pressure, and sillimanite is higher temperature, higher pressure). Of course, even "low" temperatures in this case are still beyond our imagining – kyanite usually forms at about 350-600 degrees Celsius (662-1112 F). Kyanite is most commonly found in settings of continental collisions because of its need for pressure. Next time you visit mountains, look for sky blue kyanite crystals!

This feature was posted on Dice Museum social media by Museum curator Jillian Herlinger on 9/6/2022.

Calvin UNIVERSITY 1876