

All are invited to attend the monthly meeting of the
Nittany Mineralogical Society
Wednesday, April 17, 2013

Parents/guardians must provide supervision of minors.

**Occurrence of tosudite and
associated sulfide minerals in the
Anthracite Fields of Pennsylvania**

by William E. Kochanov, P.G.
Pennsylvania Geological Survey

Our April meeting will be held Wednesday the 17th in room 114 auditorium of Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available through our web site.

– NO JUNIOR ROCKHOUNDS MEETING THIS MONTH –

6:30 to 7:30 p.m.: Social hour, refreshments in the lobby

7:30 to 8:00 p.m.: announcements, questions, answers; door prize drawings

about 8:00 p.m.: featured program

The event has free admission, free parking, and free refreshments, and is open to all. Parents/guardians must provide supervision of minors – Bring your friends and share an interesting evening.

The synclinal Lackawanna Valley of northeastern Pennsylvania exhibits a broad range of interbedded fluvial and alluvial sequences of coal- and non-coal bearing Carboniferous strata. The geology is also complicated by regional unconformities and intraformational folding and faulting.

As part of a cooperative mapping program with the U.S. Geological Survey, bedrock mapping was conducted on selected quadrangles within the Northern Anthracite Field. During mapping in the Avoca quadrangle near Scranton, clear to smoky quartz crystals were observed covering the joint surfaces of sandstone beds in the Glen Maura area. Further searching revealed a blue to blue-green coating associated with the crystals. Samples were analyzed showing that the blue coating was the clay mineral tosudite.

Tosudite is defined as a regularly interlayered chlorite-smectite clay mineral (Bailey, 1982). Generally formed as a result of hydrothermal alteration, tosudite has been associated with metallic ore zones in Japan (Shimoda, 1969).

Where observed along the eastern flank of the Northern Field, it occurs as an interstitial filling between quartz pebbles of the Pennsylvanian-age Pottsville Sharp Mountain conglomerate and along fractures within basal sandstones of the overlying Llewellyn Formation. Similar local occurrences have been recorded by Harrison and others (2003) and more regionally by Daniels and others (1990). The zinc mineral sphalerite is also associated with tosudite and occurs as euhedral microcrystals in quartz veins of the lower Llewellyn.

The lithologic dichotomy and the occurrence of tosudite being restricted to the Pottsville/ Llewellyn stratigraphic interval, is suggestive that mineralization occurred along a timeline coincident with Alleghanian-age uplift. The presence of tosudite along with the sulfide mineral sphalerite drops a tantalizing worm in front of the collector with the possibility of more extensive sulfide mineralized localities along this trend.

William (Bill) Kochanov (pronounced KO-CHAN'-OFF) is a geologist with the Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey, Geologic Mapping Division. Throughout his tenure at the Survey, he has been involved with bedrock mapping projects covering areas within the northern anthracite coal field, the northern tier Endless Mountains region, and in the Chester Valley of southeastern Pennsylvania. He has also authored 14 county reports specific to subsidence features within the karst regions of Pennsylvania as well as numerous articles pertaining to the general geology of Pennsylvania.



Bill shows a specimen of tosudite in quartz-pebble conglomerate. Close-up is about 1 inch across. D. Glick photos.