

Gneiss

Characteristic summary:

<i>Main minerals:</i>	<i>Quartz and plagioclase (white), biotite (brown).</i>
<i>Mineral Size:</i>	<i>Coarse to medium</i>
<i>Mineral morphology:</i>	<i>Platy (biotite), platy to subhedral (quartz and plagioclase)</i>
<i>Fabric:</i>	<i>Gneissose structure</i>

Noteworthy features

Components: The sample is composed of coarse quartz (Q) and plagioclase (P) crystals, which are alternating with biotite-rich layers (red arrow). The observed mineral layering occurs in broadly spaced zones, and is named gneissose structure. Image B shows the mineral layering at higher magnification. Note that some of the coarse, elongated quartz crystals have inclusions of biotite (yellow arrows).

Processes reconstructed from the thin section: With an age of about 3.9 billion years the sample is one of the oldest rocks on Earth. In such a long timespan the sample experienced numerous and intense phases of deformation and recrystallization. In particular, the deformation under the effect of strongly oriented pressure produced the rotation of minerals and organization in parallel layers (gneissose structure). The deformation also promoted the recrystallization of minerals, with a general increment of their size, as can be seen from the coarse sized biotite and quartz crystals. The recrystallization and growth of minerals is also indicated by the presence of biotite inclusions (yellow arrow) in some quartz crystals. This feature clearly indicates that the growth of quartz occurred after the formation of biotite.

Occurrence: Canada, USA, Australia, Madagascar, West Africa, Brazil, Scandinavia.

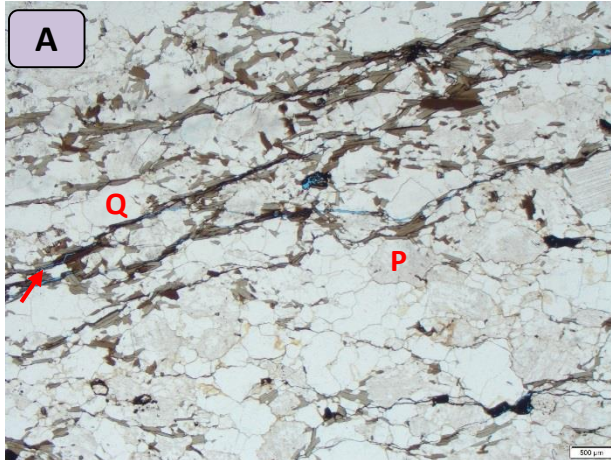
Technical use: Building stone, decorative/ornamental stone.

Sample: TU16

Type of rock: Metamorphic

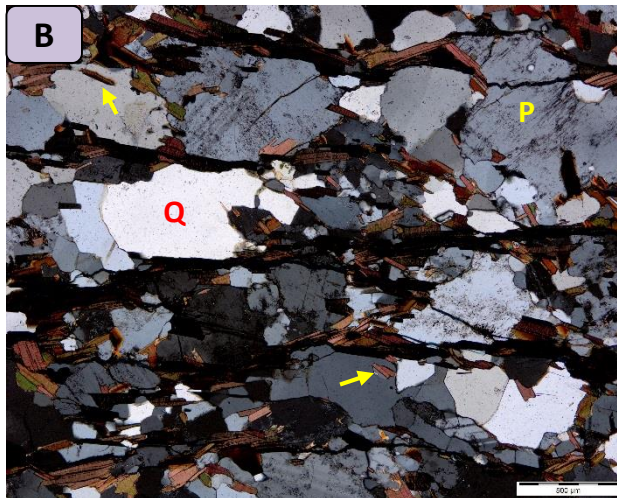
Age: 3,962 billion years

Location/Formation: Canada



PPL image

Magnification: 11x



XPL image

Magnification: 45x