

Hand specimen descriptions of metamorphic rocks

Hand specimen descriptions for metamorphic rocks are like those for igneous rocks. The objective is to tell someone looking at it everything they need to know to recognize it in the field. Descriptions should be reasonably comprehensive but clear and succinct, typically no more than two or three sentences.

- **Rock color.** One color only. After stating the overall rock color, you may then qualify it. Remember that people walk up to an outcrop from far away. “Black and white” or “green and gray speckles” means nothing from 50 meters away.
- **Rock type,** to the extent that it can be told in the field, plus other information you may have. If the rock is a phyllite but you know there is paragonite and muscovite, call the rock a muscovite-paragonite phyllite. Don’t be mysterious.
- **Grain size,** for both matrix and porphyroblasts/porphyroclasts, if you have them.
- **Visible mineralogy,** making clear which occur as porphyroblasts/porphyroclasts, if you have them.
- **Textures,** including porphyroblasts/porphyroclasts, foliation and layering (and what defines them), small folds, asymmetry, cumulates, equigranular, inequigranular, etc.

Grain sizes:	Very fine	<0.2 mm
	Fine:	<1 mm.
	Medium	1-5 mm
	Coarse	5-15 mm
	Very coarse	>15 mm



Hand sample description as a list:

Color: Grayish-pink.

Texture: Strong lineation and weaker foliation with porphyroblasts of feldspar.

Grain size: Porphyroblasts up to 0.5 x 1.5 x 20 cm, with matrix grains ~1 mm.

Visible minerals: Porphyroblasts are pink K-feldspar, and light-gray plagioclase in a fine-grained, medium-gray matrix also containing biotite and quartz.

Rock type: Granitic augen gneiss.

Hand sample description as a paragraph:

Grayish-pink augen gneiss, with pink K-feldspar and light-gray plagioclase porphyroblasts up to 0.5 x 1.5 x 20 cm, in a fine-grained, biotite- and quartz-bearing matrix. Strong lineation and weak foliation is defined by porphyroblasts.

The point of hand sample descriptions is to give enough information so someone at a complex outcrop could easily find the rock described. In this case, the term K-feldspar is used in place of a more specific term because the structural state of K-feldspar cannot be determined by eye, and perthite exsolution textures, if present, happen to be too small to see here. In this rock, however, the K-feldspar is microcline. The protolith of this rock was probably a porphyritic granite.



Hand sample description as a list:

Color: Light-gray.

Texture: Conglomeratic texture, wide range of clast sizes, mostly rounded, weakly foliated.

Grain size: Clasts range in size from 1 to 30 mm across.

Visible minerals: Clasts are mostly white vein quartz, with minor muscovite in the matrix.

Rock type: Conglomeratic quartzite.

Hand sample description as a paragraph:

Light-gray, weakly foliated conglomeratic quartzite. Most clasts are white vein quartz, 1-30 mm, with muscovite in the gray matrix.

The white color of the quartz suggests numerous fluid inclusions, which are characteristic of the quartz in quartz veins. It is more suggestive of a quartz clast source, because some quartz veins have clear quartz, and recrystallization can clear the white color. The protolith for this rock was a quartz-pebble conglomerate.



Hand sample description as a list:

Color: Medium-greenish-gray.

Texture: Strongly foliated with crenulations deforming the cleavage.

Grain size: Fine-grained, with quartz vein augen up to 1 cm across.

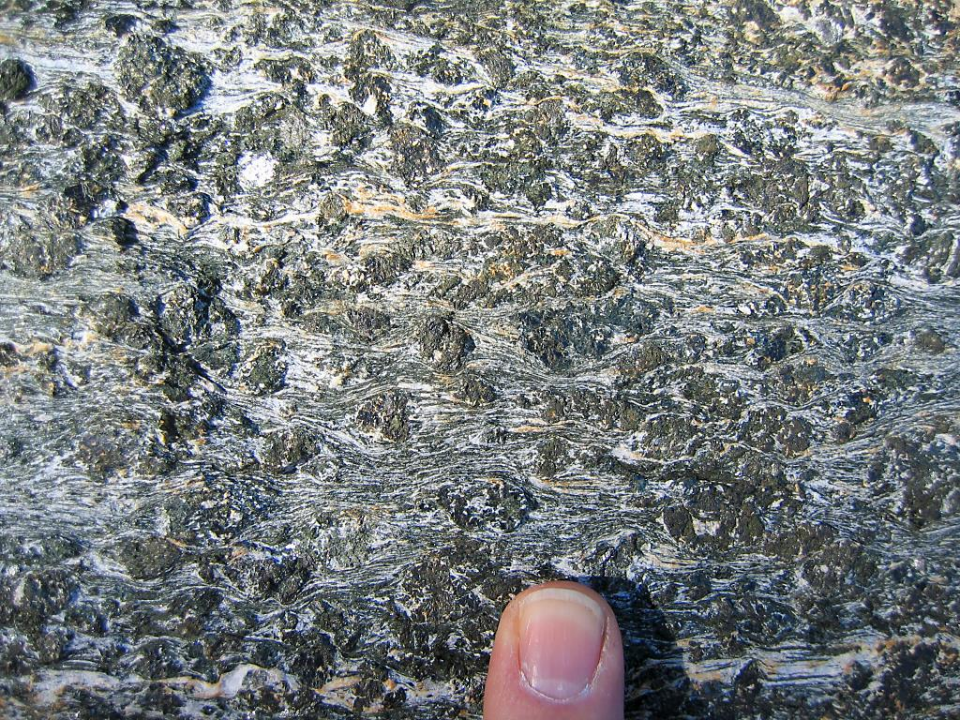
Visible minerals: Chlorite, muscovite, quartz, with some quartz in augen.

Rock type: Muscovite-chlorite schist.

Hand sample description as a paragraph:

Medium-greenish-gray, strongly foliated muscovite-chlorite schist, with crenulations deforming the foliation. Quartz occurs in the matrix and as quartz vein augen up to 1 cm across.

The vein quartz augen are white, lens-shaped patches in the plane of the foliation. The green color suggests chlorite, and the white flakes on cleavage surfaces suggest muscovite, with glassy-clear quartz in between. The strong foliation, having been deformed by later crenulations, suggests at least two episodes of deformation. The protolith of this rock was probably a shale, with the metamorphic grade too low to stabilize biotite.



Hand sample description as a list:

Color: Grayish-green.

Texture: Dark-green, equant porphyroclasts surrounded by an irregular foliation.

Grain size: Porphyroclasts are mostly 3-10 mm across, in a fine-grained matrix.

Visible minerals: Hornblende occurs as porphyroclasts, along with plagioclase and epidote in the matrix.

Rock type: Porphyroclastic amphibolite.

Hand sample description as a paragraph:

Grayish-green amphibolite, with 3-10 mm equant hornblende porphyroclasts in a fine-grained, irregularly-foliated matrix of hornblende, plagioclase, and epidote.

The texture of this rock is relatively common, and quite distinct from mineralogically and compositionally similar amphibolites nearby, which are fine-grained, more or less equigranular, and more strongly foliated. The texture in this sample is interpreted to be, in part, relict from its gabbroic protolith, where the porphyroclasts were once large pyroxenes, either cumulate or poikilitic, interstitial grains. The geochemistry of these rocks differs from other, nearby amphibolites in ways that also suggest its origin as a gabbroic cumulate.