

Biotite

Potassium iron magnesium aluminum silicate hydroxide fluoride



Biotite is a common rock forming mineral, being present in at least some percentage in most igneous and both regional and contact metamorphic rocks. The typical black to brown color of biotite is characteristic although it is difficult to distinguish brown biotite from dark brown phlogopite.

The two are actually end members in a series that is dependent on the percentage of iron. Phlogopite is iron poor and biotite is iron rich. The darker color and density increase with an increase in the iron content. Biotite tends to form in a wider range of conditions than phlogopite which is limited mostly to ultramafic rocks and magnesium rich marbles and pegmatites.

Try scratching the black grains with a nail or knife. Biotite will flake off easily. Biotite is differentiated from amphibole by shape of the crystals (hexagonal for biotite and elongated or needle-like for amphibole) and by hardness (biotite is soft, amphibole is hard).

It is differentiated from pyroxene by hardness, color (biotite is black and pyroxene dark green) and occurrence (biotite is found in light-colored igneous rocks like granites, diorites and rhyolites while pyroxene occurs in dark-colored rocks like gabbro and basalt). Expect to find biotite as a common accessory in granite, and as phenocrysts in some rhyolites.