



Arizona Rocks 10

Text and photos by Ray Grant

We are almost done with igneous rocks. I hope you are getting the idea that igneous rocks are named based on two features. First the textures, is it fine-grained, coarse-grained or glassy, etcetera, and second the chemistry (minerals). Another common textural term used with igneous rocks is porphyry, which means the rock has two sizes of crystals. Mostly it is used for volcanic rocks where the magma started to cool underground and large crystals were forming and then it erupted out on the surface and the remaining magma cooled quickly forming small crystals. The volcanic rock name basalt, rhyolite, felsite, and andesite would be used with porphyry to name these rocks such as basalt porphyry.

Less commonly, a coarse-grained intrusive rock can have two sizes of crystals; the most common would be granite porphyry or porphyritic granite. This rock is important in Arizona as the major copper deposits are associated with porphyritic intrusive rocks and referred to as the "porphyry copper deposits". The deposits at Ajo, Bagdad, Morenci, Ray, San Manuel, and others are classified as this type of deposit.

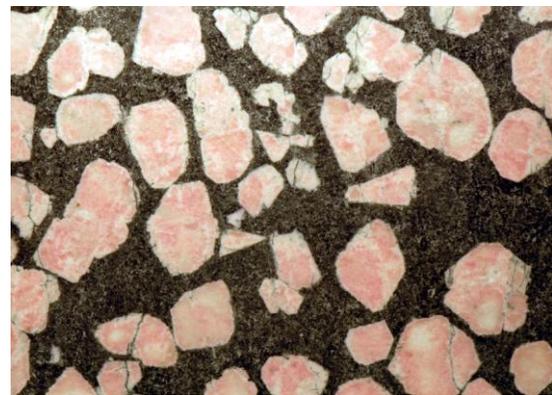
Next month we will do a summary of the igneous rock classification and names.



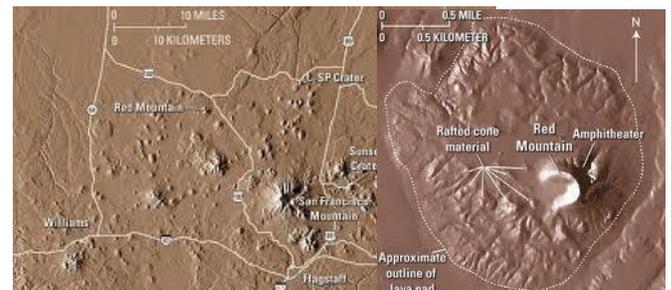
Pyroxene crystals in basalt from Red Mountain north of Flagstaff



Altered feldspar crystals in basalt from western New Mexico



Diorite porphyry from near Cue in Western Australia (Stan Celestian photo)



Red Mountain volcano is a spectacular and unusual cinder cone; unusual in that its internal structure is exposed. To reach Red Mountain from Flagstaff, drive northwest on Highway 180, this highway snakes through the central part of the San Francisco Volcanic Field on its way toward the Grand Canyon. About 25 miles from Flagstaff (at milepost 247), turn left at the Forest Service sign that announces the Red Mountain Geologic Area. Drive about a quarter mile on the dirt road to a parking space at the trailhead. The walk from there to the base of Red Mountain takes about 30 minutes. Carry plenty of drinking water (at least a liter of water per person). Trees in the natural amphitheater provide some shade. (Above photos and text by USGS)