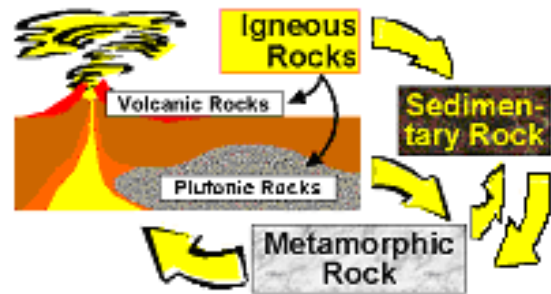


Intrusive Activity and the Plutonic Rocks

- Igneous rocks are primary rocks in the rock cycle and form by solidifying from molten condition.
- There are two kinds of igneous rocks: plutonic and volcanic.
- Intrusive or plutonic rocks form from the slow cooling and solidification of magma.
- These intrusive bodies can form either near- surface (volcanic necks or plugs, dikes and sills) or be deep-seated (plutons like stocks and batholiths).

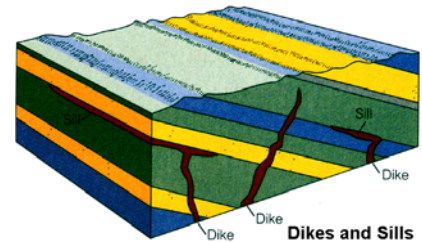


The red and pink shaded regions in this geological map of California are intrusive igneous bodies, for instance. You can access this map at the California Geological Survey website (http://www.consrv.ca.gov/cgs/information/geologic_mapping/index.htm#Related%20Links). These igneous intrusives form the bulk

Following links have interesting 'rock cycle' presentations:
<http://www.bbc.co.uk/education/rocks/rockcycle.shtml>
<http://www.intel.com/education/unitplans/rockcycle/rock.htm>
<http://www.moorlandschool.co.uk/earth/rockcycle.htm>



of the Sierra Nevada Ranges. Contrasted with these large batholiths are such more common though shallow or near-surface features as dikes and sills.



- The intrusive igneous rocks have phaneritic (or coarse grained) to porphyritic textures, compared to the porphyritic to aphanitic textures of extrusive igneous rocks.
- Felsic (60-75% silica, with "free" quartz) composition dominates the intrusive or plutonic rocks (e.g., granites and granodiorites), compared to the mafic (with ~50% silica, no "free" quartz) basalts in the case of extrusive or volcanic rocks. Gabbro, the plutonic equivalent of basalt, is mafic and diorite, the plutonic equivalent of andesite, is of intermediate composition.

- Granites and granitization complete the "rock cycle" as granite batholiths, the most common plutonics, often form in the core zones of folded mountain belts through the process of dynamothermal metamorphism. But then, note that the primordial crust too is likely to have been granitic.

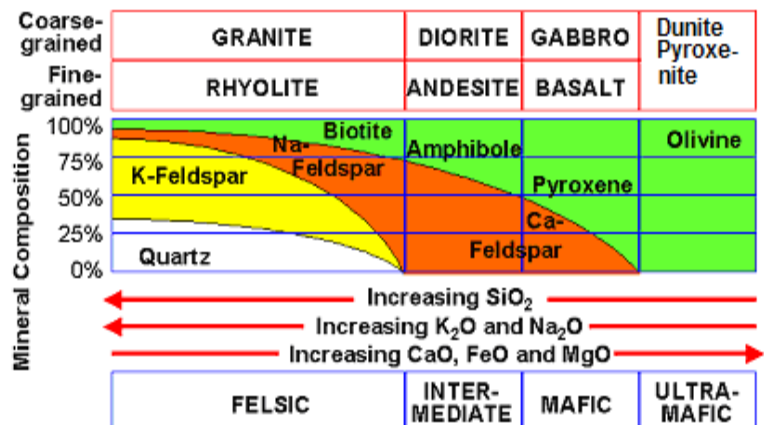
Want to take a self-test on igneous rocks and processes? Try North Dakota State University's Geoscience website at the URL: <http://www.ndsu.nodak.edu/instruct/schwert/geosci/g120/igneous.htm>



This image of a granite sample is from the USGS

website on rocks and minerals at the URL:

<http://geology.wr.usgs.gov/docs/parks/rxmin/rock.html#igneous>



Try the URL: <http://www.dc.peachnet.edu/~pgore/geology/geo101/igneous.htm> or <http://volcano.und.edu/vwdocs/vwlessons/lessons/Slideshow/Igrocks/Igindex.html> to view the samples of different igneous rocks.