

Igneous Rock Classification

texture \ /	color >	light colored pink, white, gray green, lavender	medium to dark colored purple, greenish	dark gray to black	dark green to black
	minerals>	10 - 30% orthoclase (potassium-feldspar) 10 - 40% quartz 0-33% Na plagioclase 8-15% amphibole and biotite	55-70% plagioclase feldspar 15-40% biotite & amphibole	25-70% Ca plagioclase 25-75% dark mafic minerals (pyroxene, amphibole, olivine)	0-5% Ca plagioclase 65-100% olivine 0-25% pyroxene 0-10% ore minerals (magnetite, ilmenite, chromite)
composition		Felsic (sialic)	intermediate	Mafic	ultramafic
fine = aphanitic	extrusive volcanic	Rhyolite	Andesite	Basalt	Komatiite
coarse = phaneritic	intrusive plutonic	Granite	Diorite	Gabbro	Peridotite
environ- ment		subduction zones	subduction zones	mid-ocean ridges, hot spots	mid-ocean ridges, mantle

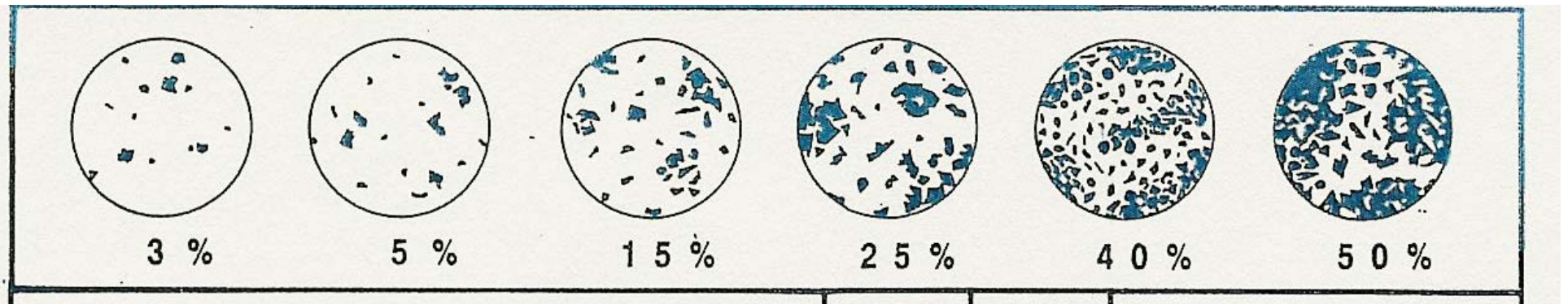
Phaneritic = coarse grained



Aphanitic = fine grained ground mass

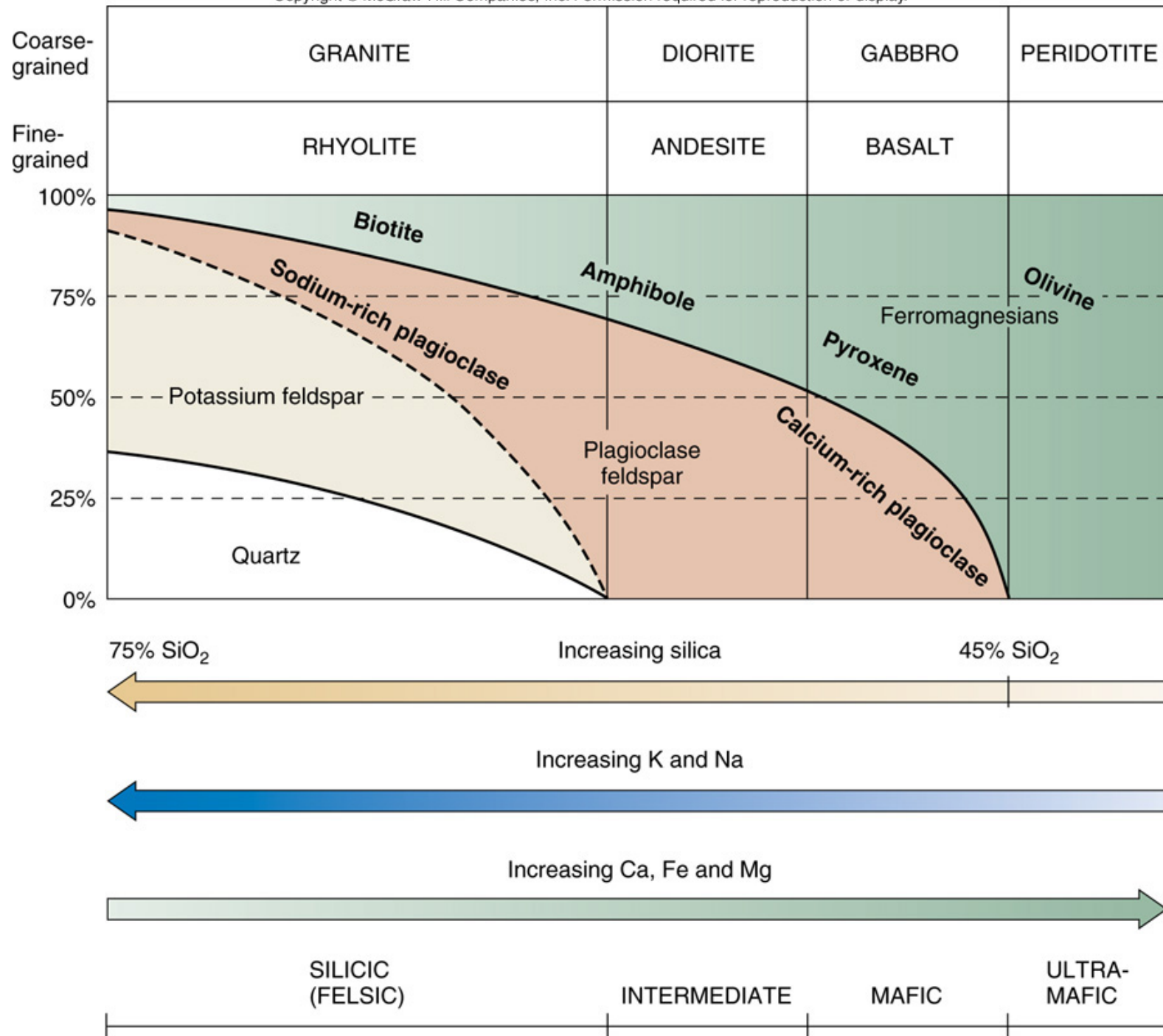


Estimating percentages



granite





granite



Granite (pegmatite)



Granite (pegmatite)



granite



granite



granite



Graphic granite



Granite (pegmatite)



granite



granite



granite



granodiorite



diorite



diorite



gabbro



gabbro



gabbro



Gabbro - anorthosite



peridotite



rhyolite



rhyolite



Porphyritic andesite



Porphyritic andesite



Porphyritic basalt



basalt



Vesicular basalt



Scoria (highly vesicular basalt)



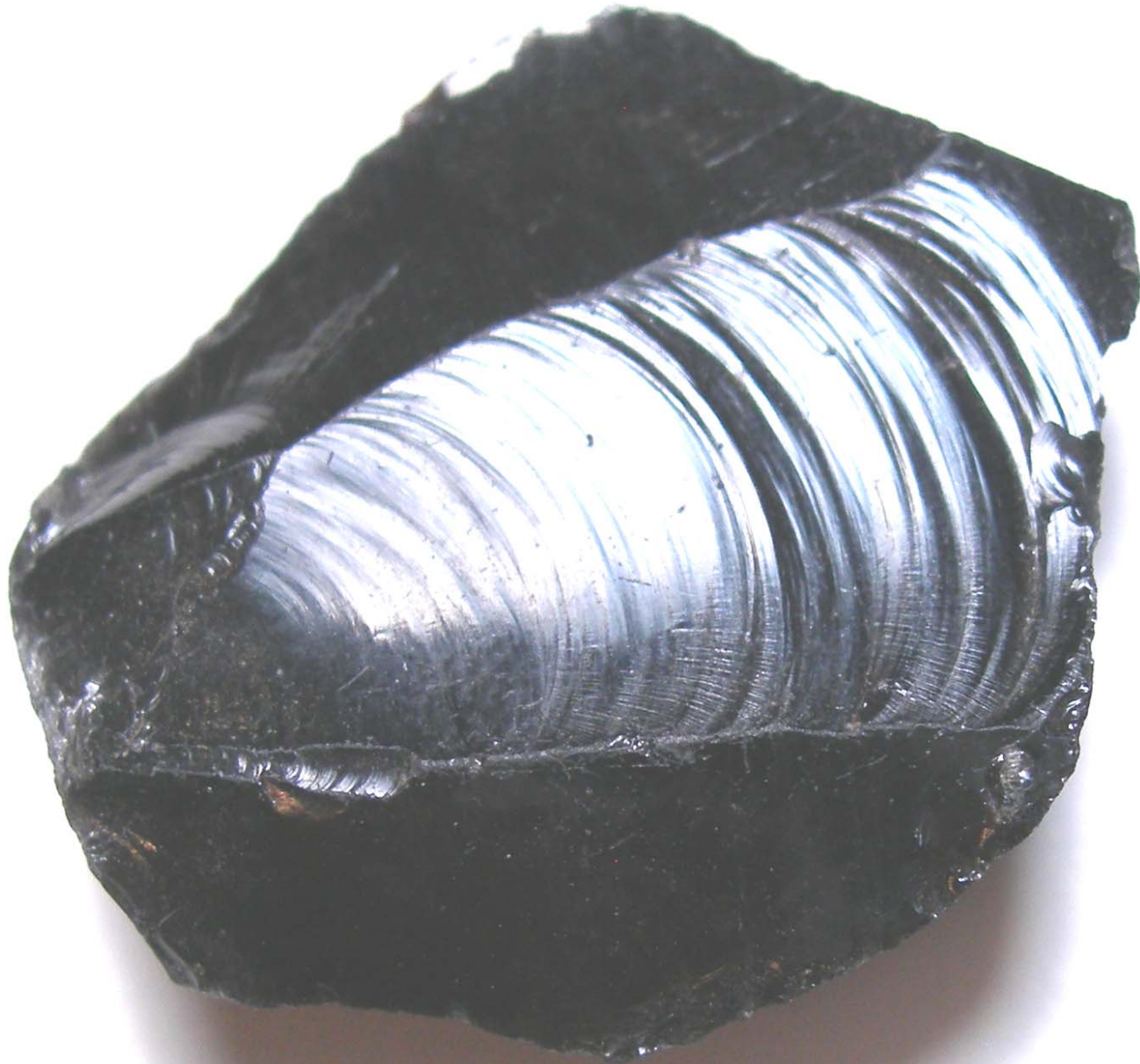
Glassy igneous rocks

texture	composition	characteristics	name
glassy	? not applicable	massive, black glass	Obsidian
glassy	? not applicable	frothy, grey glass of subparallel glass fibers with many squashed air bubbles - may float	Pumice
glassy	? not applicable	grey glass, rounded spherical structures	Perlite

Snowflake obsidian



obsidian



Mahogany obsidian



pumice



Weathered pumice



perlite



Pyroclastic igneous rocks

texture	composition	characteristics	name
pyroclastic	volcanic ash, pumice fragments, some rock fragments or glass	light colored volcanic ash, sometimes with glass and pumice fragments	tuff
pyroclastic	volcanic ash, pumice fragments, some rock fragments or glass	fine grained or gritty, light in weight if not compacted; light color	ash fall tuff
pyroclastic	volcanic ash, pumice fragments, some rock fragments or glass	particles or grains are fused or welded, with flow lines	ash flow tuff
pyroclastic	round pebbles and bombs that were blown out of a volcanic vent, with ash	volcanic fragments larger than 2 millimeters (about size of pencil point)	agglomerate
pyroclastic	volcanic bombs, pebbles, ash, pumice fragments, some rock fragments, or glass	sharp, angular volcanic fragments larger than 2 centimeters (1 inch diameter) mixed with others	volcanic breccia

tuff



tuff



tuff



tuff

Pyroclastic (particles)

ash size ($<2\text{mm}$) felsic



agglomerate

