

Generalized Rock Identification Chart For Common IGNEOUS ROCKS

TEXTURE		COMPOSITION				COMMENTS	INTERPRETATIONS
		<i>Felsic</i> < 15% dark minerals	<i>Intermediate</i> 15-40% dark minerals	<i>Mafic</i> 40-90% dark minerals	<i>Ultramafic</i> > 90% dark minerals		
PLUTONIC	Pegmatitic <i>(crystal size >3.0 cm)</i>	GRANITIC PEGMATITE	-	-	-	pegmatite crystals can grow very large (meters) pegmatites form important ore deposits (rare earth elements)	hydrous crystallization at DEPTH <u>FACTORS</u> slow cooling, water-rich crystallization, low undercooling, high crystal growth rate, very low nucleation density
	Coarse-grained (phaneritic) <i>(crystal size 5 mm to 3.0 cm)</i>	GRANITE	DIORITE	GABBRO	PERIDOTITE PYROXENITE	peridotite and pyroxenite - common mantle xenoliths in mafic volcanic rocks	crystallization at DEPTH <u>FACTORS</u> slow cooling, low undercooling, high crystal growth rate, low-moderate nucleation density
V/P	Porphyritic <i>(at least two sizes of crystals)</i> <i>Porphyritic-Phaneritic (all large)</i> <i>Porphyritic-Aphanitic (large & small)</i>	GRANITE PORPHYRY PORPHYRITIC RHYOLITE	DIORITE PORPHYRY PORPHYRITIC ANDESITE	GABBRO PORPHYRY PORPHYRITIC BASALT	KOMATIITE KIMBERLITE <i>(not common)</i>	larger crystals (phenocrysts) are surrounded by microscopic crystals (matrix or groundmass)	crystallization at DEPTH (porphyritic-phaneritic) crystallization at DEPTH & SURFACE (porphyritic-aphanitic) <u>FACTORS</u> multiple crystallization settings
	Fine-grained (aphanitic) <i>(crystal size <1.0 mm)</i> <i>(crystals too small to see by eye)</i>	RHYOLITE	ANDESITE	BASALT	-	detailed description & classification may require a microscope or chemical analysis	crystallization on SURFACE <u>FACTORS</u> fast cooling, high undercooling, low crystal growth rate, high nucleation density
VOLCANIC	Vesicular <i>(possesses holes)</i> Amygdaloidal <i>(vesicles filled)</i>	PUMICE		SCORIA VESICULAR BASALT	-	pumice floats in water, scoria does not scoria (>30% vesicles) vesicular basalt (<30% vesicles)	eruption & crystallization on SURFACE <u>FACTORS</u> fast cooling, volatile-rich (gas-rich) magma
	Glassy <i>(no crystals to very few crystals)</i>	VOLCANIC GLASS			-	amount of glass variable obsidian - felsic in composition, but tiny crystals & impurities give it a dark color	eruption on SURFACE <u>FACTORS</u> extremely fast cooling, extreme undercooling, no crystal growth, very low nucleation density
TEXTURE		CLAST SIZE			COMMENTS	INTERPRETATIONS	
		> 64 mm <i>(blocks & bombs)</i>	2 - 64 mm <i>(lapilli)</i>	< 2 mm <i>(ash)</i>			
VOLC	Pyroclastic <i>(made of pieces)</i>	AGGLOMERATE & PYROCLASTIC BRECCIA	LAPILLI TUFF	ASH TUFF	pyroclastic deposits may be welded (very hard) welded tuff	explosive eruption on SURFACE <u>FACTORS</u> volatile-rich (gas-rich) magma	