

Identification Chart For Common IGNEOUS ROCKS

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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 / INTRUSIVE	Pegmatitic <i>(crystal size >2.0 cm)</i>	GRANITIC PEGMATITE	-	-	-	pegmatite crystals can grow very large (meters) pegmatites form important ore deposits (rare earth elements)	hydrous crystallization at DEPTH slow cooling, high crystal growth rate, very low nucleation density, water-rich crystallization
	Coarse-grained (phaneritic) <i>(crystal size 5 mm to 2.0 cm)</i> medium-grained 1 to 5 mm	GRANITE SYENITE GRANODIORITE TONALITE	DIORITE	GABBRO	PERIDOTITE PYROXENITE	many felsic varieties peridotite and pyroxenite - common mantle xenoliths in mafic volcanic rocks	crystallization at DEPTH slow cooling, high crystal growth rate, low-moderate nucleation density
	Porphyritic <i>(at least two sizes of crystals)</i> <i>Porphyritic-Phaneritic (all large)</i> <i>Porphyritic-Aphanitic (large & small)</i>	PORPHYRY PORPHYRITIC RHYOLITE	PORPHYRITIC ANDESITE	PORPHYRITIC BASALT	KIMBERLITE KOMATIITE <i>(not common)</i>	larger crystals (phenocrysts) are surrounded by microscopic crystals (matrix or groundmass)	crystallization at DEPTH (porphyritic-phaneritic) crystallization at DEPTH & on SURFACE (porphyritic-aphanitic) multiple crystallization factors
	Fine-grained (aphanitic) <i>(crystal size <1.0 mm)</i> <i>(crystals too small to see by eye)</i>	RHYOLITE TRACHYTE DACITE	ANDESITE	BASALT	-	detailed description & classification may require a microscope or chemical analysis	eruption & crystallization on SURFACE fast cooling, low crystal growth rate, high nucleation density
	Vesicular <i>(possesses holes)</i> Amygdaloidal <i>(vesicles filled)</i>	PUMICE		SCORIA VESICULAR BASALT	-	pumice floats in water, scoria does not scoria (high vesicle %) vesicular basalt (low-moderate vesicle %)	eruption & crystallization on SURFACE 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 extremely fast cooling, minimal crystal growth, very low nucleation density
VOLCANIC / EXTRUSIVE	Pyroclastic <i>(made of pieces)</i>	CLAST SIZE			COMMENTS	INTERPRETATIONS	
		> 64 mm <i>(bombs & blocks)</i>	2 - 64 mm <i>(lapilli)</i>	< 2 mm <i>(ash)</i>			
		AGGLOMERATE & PYROCLASTIC BRECCIA	LAPILLI TUFF	ASH TUFF	welded tuff pyroclastic deposits may be welded (very hard)	explosive eruption on SURFACE volatile-rich (gas-rich) magma	