GLOSSARY OF ABBREVIATIONS USED IN PETROGRAPHIC DESCRIPTIONS

***By* Graham C. Wilson,**
Turnstone Geological Services Ltd,
P.O. Box 1000, Campbellford,
Ontario, CANADA K0L 1L0

http://www.turnstone.ca

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The following are often obvious, but for the record customary abbreviations are explained here, with some additional notes on procedures. This system has been evolved for detailed, standardised descriptions (Turnstone numbered descriptions, #401 on). Summaries of all descriptions (~4,000) are stored in the **PETSUM** database, and complete descriptions (#976 on) are created in the related **PETDAT**. Textural and summary sections are written "in full", but shorthand forms are generally used for detailed data on each mineral. The descriptions are the central feature of many of ~500 extant Turnstone reports. An earlier (1986), Spanish -annotated edition of this glossary is available: two relevant works in Spanish are: Anon (1981), Williams *et al.* (1968). Plutonic rock nomenclature follows the modal classification of Streckeisen (1976), summarized in Hyndman (1972, pp.31-41). See also Le Maitre *et al.* (1989) and Sharma (1992).

Colour

bl	blue
brn	brown
grn	green
or	orange
yl	yellow

General

anh	anhedral
assoc	associated
balsam	mounting medium: balsam or glue of similar RI.
DDH	diamond drill hole (drill core samples). Sizes: X-Ray (19.0 mm, 0.75"), A/AQ (27.0 mm, 1.06"), ATW (30.3 mm, 1.195"), B/BQ (36.5 mm, 1.44"), BTW (B, Thin Wall: 42.0 mm, 1.654"), N/NQ (47.6 mm, 1.875"), NTW (56 mm, 2.205"), NQ2 (59 mm, 2.32"), H9 (63.5 mm, 2.50"), HQ (63.0 mm, 2.48") and PQ (84.8 mm / 3.34").
dia	diameter
EDS	energy-dispersive spectrometry (of EPM)
eff in HCl	effervescence in (cold) dilute (10%) hydrochloric acid
EPM	electron microprobe analysis
esp	especially
euh	euhedral
HS	hand specimen
magnetism	magnetic samples, rich in ore minerals such as mag and magnetic pyrr, identified in HS descriptions. High concentrations of these phases yield an extremely magnetic sample, in which an offcut slice (say 45x25x5 mm) of the rock can be lifted with a small magnet. The findings can be quantified by the systematic use of a magnetic susceptibility meter (an SM-30 unit has been employed since 2006).
max/min	maximum/minimum

mesh size	examples of ASTM mesh sizes; 8 (2.36 mm), 10 (2.0 mm), 18 (1.0 mm), 20 (850 μm), 35 (500 μm), 60 (250 μm), 80 (180 μm), 200 (75 μm) and 400 (38 μm).
PIXE	Proton-induced x-ray emission (proton microprobe)
PGE	Platinum Group Elements (Os, Ir, Ru, Rh, Pt and Pd)
PGM	Platinum Group Minerals (major proportions of one or more PGE)
rel	relatively (or `relief', discontinued)
staining	K-feld staining involves the HF-sodium cobaltinitrate test (Sclar and Fahey, 1972) leaving a bright yellow stain on the feldspar. For carbonate staining a variety of methods can distinguish, e.g., calcite, dolomite, ankerite and magnesite, important in alteration assemblages. See Friedman (1959), Wolf *et al.* (1967) and Hutchison (1974).
symm	symmetric(ally)
tr	trace
WDS	wavelength-dispersive spectrometry (of EPM)

Grainsize

dia	diameter
gs	grain size - NB: section orientation influences apparent size of tabular and acicular minerals (e.g., micas and tourmalines respectively).
...fgr	fine-grained
...mgr	medium-grained
...(v)cgr	(very) coarse-grained
mm	1 mm=0.03937 inch
μm	1 micron=0.001 mm

Minerals (74 species and groups of minerals: see also Fleischer and Mandarino, 1991)

ab	albite	
act	actinolite	
amph	amphibole	
an	anorthite	
and	andradite	- Ca-Fe garnet, in context
anth	anthophyllite	
ap	apatite	
asp	arsenopyrite	
aug	augite	
bi	biotite	
cal	calcite	
carb	carbonate	
chalc	chalcopyrite	
chl	chlorite	
chr	chromite	
clzo	clinozoisite	
cord	cordierite	
cpx	clinopyroxene	
ctoid	chloritoid	
cumm	cummingtonite	
di	diopside	- Mg-Ca cpx
dol	dolomite	
en	enstatite	
epi	epidote	

fa	fayalite	-	Fe olivine
fo	forsterite	-	Mg olivine
foid	feldspathoid	-	sodalite, nepheline, etc
fstilp	ferrostilpnomelane		
gal	galena		
gar	garnet	-	common end-members include pyrope, almandine, spessartine, uvarovite, grossularite and andradite
go	goethite		
gro	grossularite	-	Al-Ca garnet
grp	graphite		
hb	hornblende		
hed	hedenbergite	-	Fe-Ca cpx
hem	hematite		
hyp	hypersthene		
ilm	ilmenite		
joh	johannsenite	-	Mn cpx
kaol	kaolinite		
K-feld	alkali feldspars	-	Kfeld: orthoclase, microcline, perthite, sanidine
ky	kyanite		
lim	limonite		
ma	marialite	-	sodic scapolite (δ=0.009)
mag	magnetite		
marc	marcasite		
me	meionite	-	calcic scapolite (δ=0.036)
moly	molybdenite		
musc	muscovite		
neph	nepheline		
of	orthoferrosilite	-	pyroxene Fe-rich endmember
oliv	olivine		
opx	orthopyroxene		
pent	pentlandite		
phlog	phlogopite		
plag	plagioclase feldspar		
px	pyroxene		
py	pyrite		
pyrr	pyrrhotite		
qz	quartz		
rieb	riebeckite		
rut	rutile		
ser	sericite		
serp	serpentine		
sill	sillimanite		
sphal	sphalerite		
sphen	sphene	-	more properly, titanite
staur	staurolite		
stilp	stilpnomelane		
tour	tourmaline	-	common varieties are schorl, dravite and elbaite
ves	vesuvianite	-	alias idocrase
woll	wollastonite	-	(may be abbreviated to `Wo', e.g., $En_{75}Of_{10}Wo_{15}$)
zir	zircon		
zo	zoisite		

Miscellaneous

C-A	Carlsbad-Albite twinning in plagioclase
QAM	Quartz- Ankerite- Mariposite rock (distinctive green alteration assemblage, as in the Mother Lode: also known as `listwanite')
QAP	Quartz - Alkali-feldspar - Plagioclase estimated modes in a rock, normalized to 100% (see Streckeisen, 1976).
QFP	Quartz-Feldspar-Porphyry

Mode

A rough visual estimate. Accessory phases <1% are annotated `Tr.' (trace): subdivisions are `Abundant tr.' and `Rare tr.'. An attempt is made to counteract the common tendency to overestimate the frequency of the dark phases. Minerals are described in order of decreasing modal abundance.

Optical Properties

aniso	anisotropic/anisotropy
bir	birefringence - relative retardation is often written in shorthand, e.g., 1st-o yl = first-order yellow. The maximum birefringence is estimated from the thickness (calculated from colours of dependable minerals, such as quartz) and the highest colours seen in the section.
birl	bireflectance
ext	extinction. May be `str' (straight, parallel to length) or `clean', meaning that the whole grain goes dark at once, c.f. strained quartz.
int	interference
LF/LS	orientation: length fast/slow
MEA	Maximum Extinction Angle (degrees) in the Michel-Levy test of plagioclase composition. Where possible, at least six suitable grains are used. MEA is also used for other minerals. For intermediate -calcic plagioclase, note that the M-L test often gives results which are rather more sodic than the the actual composition, as determined by either the Carslbad-Albite (C-A) test or by EPM (seldom noted, but see Finn, 1981). If both are available, a C-A number is generally preferred to a M-L value. In the case of albite and oligoclase below An_{20}, unless a perfectly oriented section is found, the estimate may be too calcic. This is unlikely to be a major obstacle in interpretation, although in one case plag estimated at An_8 (M-L test) and An_5 (C-A test) was found by EPM to be An_1, nearly pure albite.
PH	polishing hardness: see Uytenbogaardt and Burke (1971, pp.17-21)
Pleo	pleochroism
PPL	plane polarized light
refl	reflectance
RI	refractive index
RL	reflected light
`RL'	obliquely-incident light, sometimes employed on CTS
ST	sensitive tint plate (orientation and optic sign work)
TL	transmitted light
XP	cross-polarized light: usually with exact alignments of polarizer and analyser. In RL one is often offset (rotated) a few degrees in order to emphasise anisotropy / bireflectance. Some properties (pleochroism and relief), are described relative to the orientation of the polarizer (the `vibration plane of the lower nicol' is equivalent to the polarizer).

Ore Microscopy

For optical properties in reflected light see Craig and Vaughan (1981) or Spry and Gedlinske (1987), which each contain descriptions of ~100 opaque minerals. Properties such as scratch and polishing hardness, bireflectance and reflection pleochroism are also briefly discussed (Craig and Vaughan, 1981, pp.36-43). Descriptions of ore minerals are also listed in Uytenbogaardt and Burke (1971), Marshall *et al.* (2004), Ineson (1989) and the classic work of Ramdohr (1980).

Photomicrographs and Figures

Colour	Photomicrographs were made by using either (a) daylight- balanced colour film and a blue filter, or (b) film balanced for tungsten lighting, without a blue filter. Photos in RL may thus have bluish-grey (method (a)) or brownish backgrounds (method (b), mostly in early descriptions). Intermediate colour renditions can also be achieved with daylight film, and no blue filter. Slide film was used for maximum flexibility and quality control, with high rejection rates. Since June 2005, **digital photomicrography** has taken over, first with a Motic unit and, since July 2010, Jenoptik ProgRes C3 (firewire-linked) and CT3 (USB2) cameras on petrographic and stereo microscopes, respectively.
FOV	Field of view in mm (long axis of photo): the primary scale indicator, as nominal magnification (for a given FOV) is dependent on equipment used and may be subject to image processing and cropping.

Sample Format

CTS	covered thin section, nominal thickness 30 μm.
(D)PTS(C)	(doubly-) polished thin section (C=> circular, in 25 mm diameter form for microprobe work: some rectangular PTS are also microprobe-compatible). Used in reflected light study. For high -current ion beam analyses, such glass-backed mounts have been prepared with a thickness of about 500 μm or more: `ThPTS(C)', now generally supplanted by the PRS methods noted below.
PM	polished mount, for reflected light microscopy, also microprobe-compatible unless qualified. Generally circular, .10 mm thick.
PRS	polished rock slice, often an offcut of PTS preparation (see below).
Thickness	of CTS and PTS, gauged by interference colour of quartz or other phases. Excludes the slide margins, which commonly taper somewhat.

Sections (including the glass backing slide) are .1 mm thick: normal CTS and PTS are 46x27 mm in plan. Large sections (75x50 mm) are especially useful for structural geology, often with oriented samples. In the case of PM (`ore mounts') it is probably better to prepare smaller mounts than the older samples commonly found in teaching and museum collections. While some of these (e.g., 30 mm wide and 18 mm deep) may fit into electron microscope sample chambers, maximum compatibility with microprobe systems is achieved with circular mounts 25 mm wide and (say) 10 mm thick. Modern PM are mostly 25 mm in diameter, but larger (40 mm) PM may be useful for examining large volumes of mill products. Most of the volume is usually the epoxy mounting medium: the sample can be a few sub-mm grains, mm-scale flakes or drill chips, or a rock slice up to 25 mm wide and a few mm thick.

Special Formats include grain mounts, which typically contain 20 or more mineral grains or metal shards. These may be used especially for EPM/PIXE of diamond indicator minerals such as garnets (the PM format can also be used here). A novel mount is a polished offcut (PRS), ideally the complement of a PTS, used in Accelerator Mass Spectrometry for ultra-trace element analysis (e.g., detection levels of parts per billion for gold and PGE). In this technique, `minicores' 4 mm in diameter are often drilled from a number of PRS, and mounted in sets of 12 in a 25-mm aluminium mount, suitable for a full range of in-situ microanalytical techniques (EPM, PIXE, AMS, etc).

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