Supplementary file 1. Petrography descriptions

Description of the petrographic thin sections for the volcanic clast samples from the tuffaceous conglomerates and the agglomerate bombs. Sample AB10-06B a picrobasalt flow partially fresh is also included.

Sample Id	Locality	Rock type	Rock name	Preserved volcanic mineralogy	Secundary Mineralogy	Pseudomorph crystals	Texture	Alteration	Observations
AB15-05A	Cerro Rajón	volcanic clast from tuffaceous conglomerate	albite-sphene-actinolite granofel	Fe-Ti oxides	ab>sf>act>ox>chl>ep	Cpx	porphyritic	propylitic	Cpx pseudomorph crystals replaced with actinolite and in minor proportions chlorite. Groundmass with abundant albite crystals and actinolite microcrystals, also abundant sphene in a dusty or cloudy habit.
AB15-05B	Cerro Rajón	volcanic clast from tuffaceous conglomerate	sphene-titanomagnetite-actinolite granofel	–	sf>ox> act> cal> chl> qz> ep	Cpx	porphyritic	propylitic	Altered mafic flow with pseudomorph crystals up to 6mm large. They are replaced by actinolite. Groundmass with abundant sphene and cpx microcrystals. No albite observed. Calcite filling amygdule.
AB15-08A	Cerro Rajón	volcanic clast from tuffaceous conglomerate	actinolite-sphene-calcite granofel	–	act>sf>cal>chl>ox> ep> qz	Cpx>Ol	porphyritic, amygdaloid	propylitic	Porphyritic rock rich in pseudomorphs and filled amygdule. Calcite is mainly replacing the pseudomorph crystals. Actinolite is replacing the original cpx crystals. Groundmass with abundant actinolite in decussate fabric and sphene in dusty habit. Calcite filling cavities. This samples is probably a fragment from the base of a flow.
AB15-08B	Cerro Rajón	volcanic clast from tuffaceous conglomerate	actinolite-sphene granofel	–	act>sf>ox>cal>ep	Cpx>Ol	porphyritic	propylitic	Abundant pseudomorph replaced with actinolite and titanomagnetite. Groundmass with abundant dusty sphene, oxides and albite in minor proportions.
AB16-49B	Cerro Rajón	volcanic bomb from agglomerate	albite-sphene granofel	–	ab>sf>ox>qz>act>chl>cal>ser>hem	–	aphanitic	silicification	Silicificated clast with quartz and calcite veins. The veins have little amounts of hematite and sericite. Groundmass with abundant albite and actinolite in a decussate texture.

AB16-49D	Cerro Rajón	volcanic bomb from agglomerate	quartz-sphene granofel	Fe-Ti oxides	qz>sf>chl>hem	Cpx=Ol	aphanitic	silicification	The thin section show only one pseudomorph from cpx, now replaced with oxides. There is a intense silicification affecting all the samples. Quartz is filling amygdule. The groundmass has abundant sphene crystals. A partial crystal orientation has been developed.
AB11-40C	Cerro Calaveras	volcanic clast from tuffaceous conglomerate	calcite granofel	–	cal>hem and ox>> ab and qz	Cpx>Ol	porphyritic	carbonatization	Strong carbonatization replacing almost entirely the original mineralogy. Calcite veins and patches. Most pseudomorph crystals are replaced by hematite and Fe-Ti oxides.
AB11-39	Cerro Calaveras	volcanic clast from tuffaceous conglomerate	meta-peperite	–	ox>sf>>cal>ser>chl>qz	Frag. Rx	peperitic	propylitic	An orientated texture and rounded small grain from sedimentary origin, can be observed. Original rock texture was erased but it might have been pyroclastic. Groundmass with abundant sphene, and Fe-Ti oxides.
AB16-02C	Cerro Calaveras	volcanic clast from tuffaceous conglomerate	albite-sphene-actinolite granofel	Fe-Ti oxides	ab>sf>act>cal>chl>ep	Cpx>Ol	porphyritic	propylitic	Actinolite and chlorite replacing pseudomorphs crystals up to 3mm long. Groundmass is made of acicular actinolite microcrystals in a decussate texture. Albite and sphene are also present in the groundmass. Calcite is present in veins with up to 250 microns wide.
AB16-O2A	Cerro Calaveras	volcanic clast from tuffaceous conglomerate	albite-sphene-actinolite granofel	Fe-Ti oxides	ab>sf>act>chl>cal>ep	Cpx>Ol	porphyritic	propylitic	Primary mineralogy shapes are recognized as cpx and olivine crystals, now replaced with actinolite and chlorite. Groundmass with abundant albite in a late stage of crystalization. Abundant sphene in the groundmass and ocationally calcite veins.
AB11-47C	Cerro Calaveras	volcanic clast from tuffaceous conglomerate	calcite-chlorite granofel	Fe-Ti oxides	cal>chl>act>sf>ep>ox> qz	Cpx>>Ol	porphyritic	propylitic	Pseudomorph crystals altered to chlorite, actinolite and calcite. Epidote is also growing in the large crystals. Groundmass formed of actinolite, sphene and less abundant Fe-Ti oxides. Calcite amygdules. Calcite veins.

AB14-05A	Cerro San Agustín	volcanic clast from tuffaceous conglomerate	calcite granofel	Fe-Ti oxides	cal>hem>sf>ox>ab	Cpx>Ol>Amig.	porphyritic	carbonatization	Strong carbonatization present in the groundmass and pseudomorph crystals. It is possible to observe cpx shapes now altered. Groundmass with abundant sphene.
AB14-05B	Cerro San Agustín	volcanic clast from tuffaceous conglomerate	calcite granofel	Fe-Ti oxides	cal>sf>ab?	Ol y Amig.	porphyritic	carbonatization	Calcite abundant in the groundmass and replacing the original mineralogy. Groundmass with abundant sphene, Fe-Ti oxides and plagioclase?
AB10-06B	Cerro San Agustín	volcanic flow	ankaramite	Cpx, Fe-Ti oxides, pl	sf, ab	Ol	porphyritic	minor alteration	Picrobasalt flow with fresh diopside euhedral to subhedral phenocrysts. Olivine shapes, now recrystallized, can be observed. The groundmass is mainly formed by a second generation of diposide microcrystals, titanomagnetite and sphene in a cloudy habit and include both andesine and albite in a late stage of crystallization.
AB11-20C	Cerros de la Ciénega	volcanic clast from tuffaceous conglomerate	calcite granofel	–	cal>ox>ab>sf	Ol>Cpx	porphyritic	carbonatization	Carbonate veins and an original mineralogy entirely replaced with carbonates. Fe-Ti oxides are abundant in the groundmass and less abundant albite. Calcite in patches.
AB11-20F	Cerros de la Ciénega	volcanic clast from tuffaceous conglomerate	albite-calcite granofel	–	ab>cal>ox	Ol	micro-porphyritic	carbonatization	Presents large calcite patches up to 0.5 mm, calcite veins and albite on the groundmass. pseudomorph crystals are replaced with oxides and calcite.
AB11-20O	Cerros de la Ciénega	volcanic clast from tuffaceous conglomerate	calcite-albite granofel	–	cal>ab>ox>ser	Cpx>Ol	porphyritic	carbonatization	Groundmass with abundant albite, calcite in patches. The primary mineralogy is completly replace with carbonates, oxides and sericite.

AB11-20D	Cerros de la Ciénega	volcanic clast from tuffaceous conglomerate	quartz granofel	–	qz>ox>ab?	NA	aphanitic	silicification	Oxides are observed as microcryst in the matrix. It has abundant quartz veins. The smaller microcrystals may be albite.
AB11-20L	Cerros de la Ciénega	volcanic clast from tuffaceous conglomerate	albite-sphene granofel	–	alb>sf>ox>cal	NA	aphanitic	carbonatization	Melanocratic sample with aphanitic texture with abundant albite, sphene and oxides. Thin calcite veins can be observed.

act = actinolite, ab = albite, cal = calcite, chl = chlorite, hem = hematite, ox = Fe-Ti oxides (mainly titanomagnetite), qz = quartz, ser = sericite, sf = sphene, cpx = clinopyroxene.