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ABSTRACTS

MINERALOGÍA

POLIMORFOS DEL TiO_2 DE APLITAS-PEGMATITAS EN PAPACHACRA, PROVINCIA DE CATAMARCA

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ABSTRACT

TiO_2 polymorphs from aplite-pegmatites in Papachacra, Catamarca Province.

Rutile, brookite and anatase occur in aplite-pegmatites and pegmatitic pods related to the epizonal A-type El Portezuelo granite. Anatase is found as amber to black striated crystals up to 1 mm long, displaying the forms {101} (prominent) and {001} (small). It is chemically rather homogeneous and contains up to 0.67% Ta_2O_5 , 1.83% Nb_2O_5 , 2.48% Fe_2O_3 and 0.32% MnO . Brookite occurs as mm-sized light yellow tabular crystals or as an alteration product of ilmenite, mixed with rutile. Rutile is the most abundant TiO_2 polymorph; it occurs as: 1) single homogeneous grains, 2) as grains with exsolutions of tantalite-(Fe), and 3) as pseudomorphs after ilmenite. It displays chemical zoning, with rims enriched in Ta and Nb (up to 5.98 % Nb_2O_5 and 8.66 % Ta_2O_5); $\text{Fe}/(\text{Fe}+\text{Mn})$ ranges between 0.80 and 0.99, while $\text{Nb}/(\text{Nb}+\text{Ta})$ is between 0.51 and 0.83. Rutile associated with tantalite-(Fe) is very Ta-rich (37.29% Ta_2O_5 , 8.54% Nb_2O_5). Most analyses show an excess of Fe over that required to balance M^{5+} . Ilmenite occurs as euhedral crystals (now mostly replaced by TiO_2) that are Mn-poor (up to 0.33% MnO); its Nb content (0.34% Nb_2O_5) is normal for ilmenite from pegmatitic environments, but it contains rather high Ta (0.10% Ta_2O_5).

Rutile and ilmenite are the major Ta and Nb carriers in El Portezuelo granite, and they are also a sink for these elements in aplite-pegmatites, although in these last rocks probably most of the Ta and Nb are hosted by pyrochlore-group minerals and complex Y-Ta-Nb oxides. F played an important role in the concentration of these HFSE.

Palabras clave: rutilo - anatasa - brookita - análisis de microsonda - pegmatitas de tipo NYF

Key words: rutile - anatase - brookite - microprobe analyses - NYF-type pegmatites

CARACTERÍSTICAS MINERALÓGICAS Y ESPECTROSCÓPICAS (FTIR) DE SULFATOS DE Ba Y Sr DE DEPÓSITOS EMPLAZADOS EN LA SECUENCIA JURÁSICO-CRETÁCICA DE LA CUENCA NEUQUINA

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ABSTRACT

Ba-Sr sulphates of several mineralizations emplaced in the Jurassic-Cretaceous sequence of the Neuquén Basin has been investigated. They were studied by means of mineralogical, structural (XR diffraction), FTIR spectroscopic and EDAX microanalysis methods.

The barite-celestite crystals mainly show tabular habit, with predominance of {001}, {210}, {101} and {011} crystallographic forms. These crystals vary from idiomorphic to xenomorphic shapes. Some XRD reflections of the barite pattern are shifting to lower d values with the cationic content, in agreement with the decrease of the cell volume with the increase of Sr in the lattice. Microanalysis reveals that the Sr contents in barites fluctuate between 3.4 and 15.2 wt %. The presence of PbO (up to 19 wt %) is observed in one sample whereas traces of CaO and MgO are eventually detected. On the other hand, celestites have only low content of BaO (0.0 to 8.4 wt %).

FTIR technique clearly reveals the presence of the solid solution and shows that the S-O bond length increases with the divalent ion size.

The trend can be useful to estimate the composition of a member of the solid solution. Likewise, the band of carbonate in some samples (together the Ca content) are symptomatic of the calcite presence.

Palabras clave: Mineralogía - espectroscopía de infrarrojo - sulfatos de Ba y Sr - Jurásico-Cretácico - Cuenca Neuquina

Key words: Mineralogy - infrared spectroscopy - Ba-Sr sulphates — Jurassic-Cretaceous-Neuquén Basin

LOS BORATOS DEL SALAR DE LINA LARI, DEPARTAMENTO SUSQUES, JUJUY

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ABSTRACT

The Lina Lari salar is located in the Puna region, Jujuy province, at 4200 m.a.s.l. In this paper, we present the first geological study referred to their evaporate facies. The salt pan covers a surface of 246.027 m². The exploration was carried out through 80 holes, 0.7 to 3.0 m that were excavated on the saline surface. The main evaporite facies is borate (ulexite and borax). Ulexite occurs in classic nodules (cotton-ball) and massive. Cotton balls are 5 to 20 cm in diameter.

Massive ulexite is from centimeters to 1 m in white beds grown in volcanic ashes. Borax crystals vary from 0.5 to 3 cm, euhedrals, colorless to greenish and the borax-facies is present only in the SE of the salar with 0.50 m as maximum thickness. Borax is transformed in tincalconite at surface.

The main depocenter has 1.10 m of borates. We present here the first isopach map of Lina Lari and facies distribution. Calcium carbonate, borate and sodium chloride are present from the border to the center of the basin. The deposit was mined through the past century and small quantities of borates are mined today. The genesis is related to boron rich thermal springs in a closed basin surrounded by volcanism in an arid climate. It is interesting, that the Lina Lari salt pan is an actualist model of the Loma Blanca Miocene (6.99 Ma) deposit. Also, we mention here, for the first time, the presence of Miocene borate beds surrounding the Lina Lari basin, which are composed by inyoite, ulexite and borax.

Palabras clave: boratos - Lina Lari - Puna jujeña - evaporitas continentales

Key words: borates - Lina Lari - Puna jujeña - continental evaporites

CONDICIONES P-T DE CRISTALIZACIÓN DE CUARZOS DEFORMADOS DE LAS PEGMATITAS DEL DISTRITO COMECHINGONES, CÓRDOBA, ESTIMADAS A PARTIR DE INCLUSIONES FLUIDAS

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ABSTRACT

In this contribution, preliminary results of a fluid inclusion study in core zone quartz samples of pegmatites from southern Comechingones Pegmatitic District, Sierras Pampeanas, are presented. These pegmatites were emplaced within the Guacha Corral Shear Zone (GCSZ), during the Famatinian orogeny. Three fluid inclusion types were recognized: type A (three-phase aqueous-carbonic, with variable degree of fill), type B (two-phase aqueous), and type C (two-phase aqueous with minor CO₂ proportions). Aqueous fluids are predominant, and usually show low to moderate salinity, ranging between 1 - 8 wt % eq NaCl. Local fluid heterogeneities with CO₂-rich fluids are observed. Coexistence between aqueous and variable CO₂ aqueous-carbonic fluid inclusions in certain occurrence modes is explained by the selective removal of the CO₂ phase in relation to aqueous from an original aqueous-carbonic fluid, developed during deformation carried out by dynamic recrystallization mechanisms. It is suggested that P-T conditions of the fluids responsible for the core zone quartz crystallization were close to those for the dynamic recrystallization. These conditions were 560°C and between 3,3 and 4,4 kb, and they agree with the ductile deformation stabilization conditions of the GCSZ during the Famatinian orogeny.

Palabras clave: pegmatitas graníticas - inclusiones fluidas - recristalización dinámica - Sierra de Comechingones

Key words: granitic pegmatites - fluid inclusions - dynamic recrystallization - Sierra de Comechingones

MINERALOGÍA DE FAUJASITA-Ca ACOMPAÑADA DE ESCOLECITA Y THOMSONITA-Ca EN VULCANITAS MIOCENAS, CORDILLERA PATAGÓNICA SEPTENTRIONAL

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ABSTRACT:

An assemblage of Ca-faujasite, scolecite, Ca-thomsonite and phillipsite were found in Miocene amygdaloid basalts of the Ñorquinco-Pulmarí Valley, near Aluminé, North-Patagonian Cordillera. Scolecite X-ray diffraction parameters indicate $a_0=18.43$, $b_0=18.93$ and $c_0=6.505$; $T_{si}=0.63$; Ca-thomsonite on prismatic crystals show $a_0=13.019$, $b_0=13.066$ and $c_0=13.115$; $T_{si}=0.58$. Moreover, chemical analysis on Ca-faujasite, found for the first time in the Andean Cordillera, show a 0,66 value for the T_{si} parameter.

The study of this paragenesis that appears as an infill in veins and amygdales and as a secondary alteration product in phenocrysts and matrix, indicates that the Tertiary volcanic rock pile was affected by a low temperature alkaline hydrothermal pulse that coincide with the very low grade metamorphism previously proposed in the areas nearby Ñorquinco and Pulmarí lakes.

Keywords: Scolecite, Ca-Faujasite, Ca-Thomsonite, Very Low Grade Metamorphism, Patagonia.

Palabras claves: Escolecita, Faujasita-Ca, Thomsonita-Ca, Metamorfismo de muy bajo grado, Patagonia.

MINERALOGÍA DE LAS VETAS DE MINA ROSARITO, DISTRITO EL INFIERNILLO, BLOQUE DE SAN RAFAEL, MENDOZA, ARGENTINA

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ABSTRACT

Rosarito mine is an ore vein deposit located in the San Rafael Massiff, province of Mendoza, Argentina and genetically linked to El Infiernillo porphyry copper. It is hosted by a Permian ignimbrite with phyllic alteration overprinted by carbonatization. The ore paragenesis consists of a galena, sphalerite, Ag-tetraedrite and minor chalcopyrite and magnetite in a quartz and carbonate gangue. Geochemical analyses of vein samples reveal Zn contents about 3% and significant Cu, P, Ag and Sb anomalies in accordance with the recognized mineralization.

Palabras clave: Alteración, paragénesis de mena, geoquímica, Bloque de San Rafael, Mendoza

Key words: Alteration, ore paragenesis, geochemistry, San Rafael Massiff, Mendoza

PRIMERA MENCION DE RODOCROSITA EN VETAS EPITERMALES DEL MACIZO DEL DESEADO

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ABSTRACT:

FIRST MENTION OF RHODOCHROSITE IN EPITHERMAL VEINS FROM THE DESEADO MASSIF.

The Pingüino deposit represents an atypical epithermal occurrence in the low sulfidation (LS) epithermal Deseado Massif metallogenic province. This deposit is characterized by the presence of two different mineralization styles, massive sulphide veins with high contents of Zn, Pb, Ag, In, Cd, Au, As, Cu, Sn, W, Bi, and quartz veins with anomalous values of Ag, Au and base metals. The quartz veins present banded quartz associated with reddish to brownish carbonates, which were studied by microscopy petrography and X-ray diffraction. The present contribution describes the first report of rhodochrosite in epithermal veins of the Deseado Massif. The presence of rhodochrosite in this mineralization could be indicating an affinity with intermediate sulfidation (IS) epithermal deposits.

Palabras claves: Rodocrosita, vetas epitermales LS-IS, depósito Pingüino, Macizo del Deseado.

Keywords: Rhodochrosite, epithermal veins LS-IS, Pingüino deposit, Deseado Massif.

INCLUSIONES FLUIDAS EN EL BERILO DE LA PEGMATITA DE PAILEMAN, RÍO NEGRO, ARGENTINA

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ABSTRACT

The chemical characteristics and entrapment conditions of the fluid responsible of beryl crystallization in Paileman pegmatite, placed in the northeast edge of the Macizo de Somuncurá, were analyzed by means of the fluid inclusions study.

Quartz, microcline, muscovite, tourmaline, garnet –spessartine- and isolated beryl crystals are the most common minerals of this pegmatite.

Two types of fluid inclusions were identified according to the liquid phases present at room temperature: aqueous and aqueous with CO₂. Besides, two subtypes within each of these types were recognized due to the presence or absence of solid daughter phases.

According to the measured homogenization temperatures and the calculated salinities and densities it was determined that the fluid trapped was composed by a prevailing low salinity aqueous phase with pure CO₂, with the following molar composition: xH₂O = 0.9208; xCO₂ = 0.0566; xNaCl = 0.0226.

Palabras Clave: Berilo, inclusiones fluidas, termometría.

Keywords: Beryl, fluid inclusions, thermometry

CRISTALES DE HALITA EN TOLVA, DISTRITO CONTINENTAL, FORMACIÓN HUITRÍN, NEUQUÉN

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ABSTRACT

Halite hopper crystals were found in the Continental mine district, Neuquén Province, in the sedimentary rocks of the Huitrín Formation (Miembro Salina), Cretaceous in age. These crystals constitute cubes of 4 cm on edge and they have hopped faces in the six sides; crystals growing parallel to the binary and ternary symmetry axes direction are frequent. Some crystals are twinned. Dolomite, calcite, gypsum and quartz are pseudomorphic replacement of halite. Crystals have been nucleated in the bottom of the brine during cycles of flooding and dissolution. Diagenetic replacement allows to observe details in the crystals well preserved.

Palabras clave: cubos de halita – cristales en tolva - reemplazo pseudomórfico - diagénesis

Key words: halite cubes – hopper crystals – pseudomorphic replacement – diagenesis

EFLORESCENCIAS DE SULFATOS EN TERMAS DE COPAHUE

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ABSTRACT

The emergence of a new area of geothermal activity adjacent to the Copahue Hot Springs is reported. This area presents significant fumarole activity, with the developing of mud pots and a wide area of efflorescence formed by neoformation minerals. The dominant phases are sulphur and secondary sulfates such as alunogen, halotrichite and gypsum, probably accompanied by thenardite and potassium halite. The rock field has also suffered an intense alteration, being the most important species the clay minerals (kaolinite and illite) and those of the silica group (C-opal and quartz).

Palabras claves: Termas de Copahue, eflorescencias, azufre, alunógeno, halotriquita, yeso

Key words: Termas de Copahue, efflorescence, sulphur, alunogen, halotrichite, gypsum

ESTUDIO DE LAS INCLUSIONES FLUIDAS EN EL GRANATE NEGRO DE LA FM. AUQUILCO, MENDOZA

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ABSTRACT:

Melanite is a variety of the andradite (garnet group) that was found in northern boundary of Neuquina Basin. In this area few rocks with skarn association occur toward the top of the Auquilco formation. Garnet of this assemblage is composed by Ti-rich melanite and andradite. Microthermometric studies show three different kinds of inclusions: polyphasic, biphasic liquid rich and biphasic vapor rich inclusions. Characteristics of homogenization temperatures and composition are analyzed.

Palabras clave: Inclusiones Fluidas, Melanita, Granates, Auquilco.

Key words: Fluid inclusions, Melanite, Garnet, Auquilco.

PRESENCIA DE ESCORODITA DE ALTERACIÓN HIDROTHERMAL EN EL COMPLEJO VOLCÁNICO RÍO BLANCO. ULLUM-ZONDA. SAN JUAN. ARGENTINA

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ABSTRACT

The Complex volcanic Río Blanco is composed of miocene andesite-dacite with and without hydrothermal alteration, the alteration area identification is argillic with presence of caollinite, illite-smectite, silice and scorodite.

The ASTER data, with three visible and near infrared (VNIR) bands, six short wave infrared (SWIR) bands and the five thermal infrared (TIR) bands were used to characterize the Río Blanco volcanic Complex alteration area and later use the Portable Infrared Mineral Analyzer (PIMA) for its checking.

Palabras Claves: Escoradita - Alteración Hidrotermal – Complejo Río Blanco – PIMA

Key words: Scorodite -Hydrothermal alteration – Río Blanco Complex – PIMA

EDAD DE LA MINERALIZACIÓN DE URANIO DEPÓSITO LAS TERMAS, FIAMBALÁ, CATAMARCA

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ABSTRACT

A crystallographic parameter a_0 of pitchblende from Las Termas uranium deposit was identified by X-ray diffraction analysis. It is set an estimated age of 114 Ma that locates this mineralization in the early Cretaceous Period. This age was confirmed by isotopic analysis (Pb/U), nevertheless its genetic and spatial relationship with the greisen widespread of Los Ratones granite and associated metamorphic rocks.

Key words: pitchblende, age, early Cretaceous, greisen, Las Termas, Los Ratones granite, Sierras Pampeanas, Catamarca.

METALOGENIA

EVALUACIÓN DE RESERVAS DE ULEXITA DEL GRUPO MINERO MEME, SALAR DEL HOMBRE MUERTO, PUNA ARGENTINA

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ABSTRACT

This paper shows a remarkable increase in the borate distribution and potentiality in Hombre Muerto Salar, based on new findings in the southeastern area, where the Patos river flows. The thickness distribution of the borate evapofacies is shown (in an isopach map), represented by ulexite from Meme Mining Complex (Maktub SRL.), located in the eastern sub-basin of Hombre Muerto Salar. The mining complex consists of 12 mining properties covering a total of 1,745 ha. Ulexite or boronatocalcite (hydrated sodium calcium pentaborate: $\text{CaNa}_{10}[\text{B}_5\text{O}_{16}(\text{OH})_6] \cdot 5\text{H}_2\text{O}$) is the dominant borate and this is typical of borate deposits in salt flats. It is a nodular structure (cotton balls) and forming massive beds (bars). Broadly, it consists of 25-30 % ore grade of B_2O_3 and low content of sodium chloride. An estimate has also been made of the tested ulexite reserves for the Mining Complex, using a detailed grid graph of each property. The area distribution of the borate evapofacies exhibits a delta design related to the Patos river delta. It constitutes a new genetic model for the borate deposits in the Argentine Puna.

Palabras clave: Salar del Hombre Muerto-Puna-Evaporitas-Boratos-Ulexita
Keywords: Hombre Muerto Salar-Puna-Evaporites-Borates-Ulexite.

MINERALOGÍA Y QUIMISMO DE LA PARAGÉNESIS DEL YACIMIENTO LA NIQUELINA, SALTA

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ABSTRACT

The mineralization at La Niquelina mine, Salta Province, Argentina, belong to the U-Ni-Co-Ag (As, Bi, Sb) paragenesis. Sulfides occur filling joints and as disseminations in the country rocks. Recent studies, performed in order to document the chemical compositions of the already known phases, allowed the identification of argentopentlandite, not identified in previous studies and which constitute the second known occurrence of this mineral in Argentina.

Palabras clave: Mina La Niquelina - Salta - Mineralogía - Argentopentlandita.

Key words: La Niquelina Mine – Salta – Mineralogy – Argentopentlandite.

NUEVOS DATOS SOBRE LAS FERBERITAS DEL BATOLITO DE TUSAQUILLAS, PROVINCIA DE JUJUY

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ABSTRACT

Ferberites from Tusaquillas and Liquinaste mines have been investigated using a CAMECA SX50 electron microprobe and a Scanning electron microscope. Microthermometric studies of fluid inclusions were also carried out. The W mineralization is related to a Lower Cretaceous (145-140 Ma) S-type granite (Tusaquillas Batholite), located in the Jujuy Puna, Argentina. The ore consists of mineralized endogreisen bodies of up to 2m thickness and 100m length distributed in the eastern part of the batholite and constituted by quartz, muscovite, tourmaline, topaz, minor content of apatite, fluorite, carbonates, hematite as well as secondary autunite and torbernite. Wolframite appears as 0.1 to 1 cm sized crystals embedded in quartz. The analyzed ferberites show contents between 73.22 and 76.17 wt-% FeO, between 20.17 and 22.97 wt-% WO₃, between 0.46 and 3.18 wt-% MnO (Tusaquillas mine ferberite being less manganiferous) and between 0 and 1.94 wt-% Nb₂O₅. SnO₂ (up to 0.044 wt-%) and Sc₂O₃ (up to 0.158 wt-%) have been detected; in all analyzed samples Ta is absent. Compositionally, they can be classified as normal and niobiferous ferberites. Using a scanning electron microscope, the morphology and size of fluid inclusion cavities in the ferberites were analyzed. They constitute small channels between 2 and 10 µm crystallographically oriented. Three types of fluid inclusions were recognized both in ferberite and associated quartz samples: 1. aqueous inclusions (l+v) with Th between 235 and 265 °C, and salinities between 5 and 12 wt % NaCl equiv.; 2. halite saturated fluid inclusions (l+s+v) with Th between 240 and 360 °C and salinities between 34.7 and 43.3 wt % NaCl equiv.; and 3. few vapor rich inclusions. This study allowed definition of the precise compositions of the ferberites collected from the Tusaquillas batholite; normal and "light" ferberites (low density ferberites) were found in both mines sampled. The presence of this uncommon type of ferberite can be related to a high H₂O (up to 25 vol. % of fluid inclusion cavities of microscopic scale) and Nb content. Their distribution is restricted to the upper part of the cuppola granite greisens. This can be explained as fluid inclusions (carrying volatiles, Nb, Sn and Sc) are concentrated in the roof of the batholite.

Palabras clave: Batolito de Tusaquillas – ferberita – inclusiones fluidas

Key words: Tusaquillas Batholith – ferberite – fluid inclusions

ESTUDIO DE INCLUSIONES FLUIDAS EN EL CUARZO TUNGSTÍFERO DE LA VETA JULIA VIRGINIA, GRUPO MINERO PACHAO, SIERRAS DE ALTOHUASI CULAMPAJÁ, PROVINCIA DE CATAMARCA

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ABSTRACT

The tungstiferous district is located in the eastern edge of Altohuasi – Culampajá hills, Catamarca province, Argentina. Julia Virginia lode is situated in the northern flank of Pachao hill at an approximate height of 3.500 m a.s.l. In the studied area mainly out crop metamorphic rocks of Loma Corral Formation and orthogneis rocks of Chango Real Formation. The ore mineral is wolframite disseminated in quartz veins filling fractures that affect the metamorphic rocks.

The fluid inclusions presents in these veins were studied. Six types of inclusions have been recognized, including biphasic aqueous and vapour inclusions, H₂O–CO₂ inclusions and triphasic inclusions with NaCl crystals.

Palabras claves: Inclusiones fluidas, Mina Julia Virginia, depósito de wolframio

Key words: Fluid Inclusions, Julia Virginia Mine, Tungsten deposit.

MINERALIZACIONES ESTRATOLIGADAS DE U-V-Cu y Cu-Pb-Ag-EN LA ÉPOCA METALOGÉNICA II (CRETÁCICO –EOCENO) DEL NOA

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ABSTRACT

In the León-Juramento district, the Cu-Pb-Ag mineralization on the oxidized zone is asociated to lime-sandstones and micritic oolithic limestones economic horizons, which evidence dissolution and recrystalization processes with calcite neoformation. Ore is composed by esencial malaquite and calcocite, with subordinate azurite and scarce interstitial ferruginous oxides (hematite).

Malaquite is present in following textures: i) disseminated in matrix of oolithic and stromatolitic limestones, ii) calcitic oolites nucleous, iii) forming part of the concentric growing of oolites, iv) in veinlets.

Microcrystalline veinlets, asociated with main mineralization that cross-cut the mineralized units, determine a first order inyection with calcite and ferruginous oxides, and a second order that cut and displace those previous, being syngenetic with malaquite and calcocite formation.

In the Tonco-Amblayo district, the host rocks of the U-V-Cu mineralization are arkosic sandstones and gray fine-laminated lutites. Accesory omnipresent components are tourmaline and muscovite, which define a primary granitic-pegmatitic source area.

Ore is composed by uranium vanadates (carnotite, tyuyamunite) and uranium silicates (uranopilite, uranophane), and is found disseminated within arkose particles conforming a mineralizad cement. Lutites are in contact with this economic unit, bringing as well uranium components to the ore, to which it interdigitate along shear zones.

CARACTERIZACIÓN GEOLÓGICA Y ECONÓMICA DE LOS YACIMIENTOS DEL SUBGRUPO PEGMATÍTICO LA VISTOSA, DISTRITO TOTORAL SAN LUIS, ARGENTINA

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ABSTRACT

La Vistosa pegmatitic subgroup (LVPS) is located at 32° 56' 1,8"-32° 56' 12,7" S and 65° 56' 50,7"-65° 56' 47,8" W, in the Totoral pegmatitic field, Eastern Pampean Ranges of Argentina. The LVPS comprises a swarm of twenty small-size pegmatites of LCT (Li-Cs-Ta) geochemical signature outcropping on the northeastern flank of Paso del Rey leucogranitic intrusive. The magmatic units intrude the Pringles Metamorphic Complex, formed locally by Ms-Qtz-Bt-Alm-Chl-Pl-Mc-Sil-Crd±Tur-Ap-Zrn-Ep-Hem schists that eastward grade to phyllites.

The pegmatites are tabular, with N40°E to N50°E predominant strikes, and subvertical dips. They show heterogeneous, complex internal structure with variable textural patterns and mineral modes; the units or primary crystallization are border, wall, intermediate zone and quartz core, discrete muscovite and plagioclase replacement irregular bodies are always present. The mineral assemblages are characterized by the predominance of K-feldspar, quartz, muscovite and biotite; the accessory minerals are Brl-Tur-Grt-Ap and primary Fe-Mn phosphate nodules.

Based on mineralogical, structural and paragenetic attributes, the pegmatites are classified as barren-transicional to beryl-type.

Palabras clave: Subgrupo La Vistosa – pegmatita – mineralogía – caracterización económica

Keywords: La Vistosa subgroup – pegmatite – mineralogy – economic characterization

FLUORITA ACCESORIA EN GRANITOS DE ALTO POTASIO: SU APLICACIÓN EN LA PROSPECCIÓN DE MINERALIZACIONES DE W-Mo±Ag±Au MAGMÁTICAS-HIDROTERMALES.

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ABSTRACT

In the high-K, F-rich devonian granites of the sierra de Comechingones, Cordoba, the W, Mo ± Ag ± Au hydrothermal mineralizations are associated with accessory fluorite-bearing plutons, in leucogranites which evolved from rocks with Albite (An₀₇₋₀₅) and biotite contents of ~ 5% (with X_{Fe} ~ 0.70), and crystallized close to 830 °C. The formation of accessory fluorite is strongly inhibited in less differentiated plutons (typically monzogranite and exceptionally granodiorite) with oligoclase (An₂₁₋₁₂) and biotite contents > to 8% and X_{Fe} < 0.57. In this case, secondary fluorite can be formed, but there are not metalliferous mineralizations, even though the granites show evidence of pervasive greisenization. Fluorite ± epidote ± muscovite, as secondary association, was developed by subsolidus reequilibrium of the granites between 354 and 318 °C, involving cloritization of Mg-rich biotite and oligoclase. The formation of accessory and secondary fluorite was conditioned by F-OH exchange between biotite and apatite, but it essentially was the relative abundance of biotite which determined the compatible or incompatible behavior of F in the magma. The main conclusion of this study is that the greatest metallogenetic potential is restricted to the hydrothermal mineralizations related to high-silica, alkali feldspar leucogranites with accessory fluorite, which represent the most evolved products of the high-K magmatism.

Palabras clave: Fluorita accesoria; petrogénesis; metalogenia; granitos de alto K

Key words: Accessory fluorite; petrogenesis; metallogeny; high-K granites

LA ANOMALÍA MAGNÉTICA DEL PÓRFIRO ALCAPARROSA (PÉRMICO), CALINGASTA, PROVINCIA DE SAN JUAN: UN EJEMPLO DE ANOMALÍA DOMINADA POR REMANENCIA

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ABSTRACT

The magnetic anomaly of the alteration halo around the Permian Alcaparrosa porphyry is analysed. This bipolar anomaly shows a maximum to the south and a minimum to the north, opposed to the expected shape of induced magnetic anomalies in the southern hemisphere. We modelled the observed anomaly by using a body carrying a reversed magnetic remanence. A Permian reversed remanence is expected as the magnetic field was mainly reversed by the time; also measurement on surface samples provided susceptibilities and remanences as those used in the model. The shape and extension of the modelled body seems a good approximation to the possible shape of the sulphide-bearing alteration halo around the rhyodacite porphyry.

Palabras clave: Magnetometría aérea - Alcaparrosa - remanencia magnética - pórfiro - Pérmico

Key words: Aerial magnetometry - Alcaparrosa - magnetic remanence - porphyry - Permian

MANIFESTACIÓN DE INDIO EN EL MACIZO NORDPATAGÓNICO: PROYECTO SAN ROQUE, PROVINCIA DE RIO NEGRO

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ABSTRACT:

OCURRENCE OF INDIUM IN THE NORPATAGONIC MASSIF: SAN ROQUE PROYECT, RIO NEGRO PROVINCE.

Fluid inclusions (FI) and In content in sphalerite from San Roque, Río Negro province, were studied. FI into sphalerite crystals are biphasic (L+V) and show homogenization temperatures (T_h) between 215-248 °C and a salinity average of 5,6 % in weight of NaCl eq., with participation of K, Mg and Fe. An investigation by transmission electron microscopy of bands in sphalerite, revealed In near the margins of the zoned crystals. The textures, alteration and T_h and salinity from FI in sphalerite of San Roque indicate a low to intermediate sulfidation epithermal deposit.

Palabras clave: contenidos de indio - inclusiones fluidas - esfalerita - depósito epitermal - Macizo Norpatagónico

Keywords: Indium content- fluid inclusions- sphalerite- epithermal deposit - Norpatagonic Massif

AVANCES EN EL CONOCIMIENTO DE LA MINERALIZACIÓN DEL DEPÓSITO GONZALITO, PROVINCIA DE RIO NEGRO, ARGENTINA

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ABSTRACT

Gonzalito deposit is located to the southwest of San Antonio Oeste city, Rio Negro province and it represents the main vetiform polymetallic deposit of eastern Nordpatagonian Massif.

The mineralization of the veins is composed by granular aggregates of galena, sphalerite, pyrite and chalcopirite, with minor amounts of pyrrhotite, arsenopyrite, enargite, bornite, marcasite; the supergene minerals are digenite and covellite. Pyrargyrite (Ag_3SbS_3) and stephanite (Ag_5SbS_4) were identified (optically and by EDS microscopy) as inclusions within galena.

The host rock consists of gneises with sericitic alteration and amphibolites with incomplete propylitic alteration. The chemical analyses show that host rock, near the veins, is enrichment in Pb, Zn and Ag. The mineralization in gneises and amphibolites is scarce and it partly coincides with the one described for the veins, except for the presence of irregular grains of native silver disseminated and associated to veinlets of sphalerite.

The vein's mineralogy, the ore and gangue minerals textures and the alteration types suggest filling and replacement veins formation due to a hydrothermal process.

Palabras clave: Depósito Gonzalito, mineralogía, plomo, plata, cinc

Key words: Gonzalito deposit, mineralogy, lead, silver, zinc

INCLUSIONES FLUIDAS E ISÓTOPOS ESTABLES DE VETAS WOLFRAMÍFERAS DEL PLUTÓN SAN MARTÍN, DEPARTAMENTO VALCHETA, PROVINCIA DE RÍO NEGRO, ARGENTINA

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ABSTRACT

The W-bearing veins located in the eastern of Rio Negro province, 25 km NE from Valcheta, are contained within a Permian San Martin Pluton.

The mineralization is divided into two stages: stage *I*, characterized by K-feldspar + quartz + wolframite (*Ia*) and quartz + wolframite (*Ib*); and stage *II*, composed of base metals sulphide. Fluid inclusion data indicate the simultaneous trapping of CO₂-rich, CO₂+H₂O-rich and H₂O-rich fluid inclusions in quartz of the stage *I* (*Ia* and *Ib*), is evidence of heterogeneous fluid with immiscibility of CO₂ in H₂O during the first stage. Deposition of wolframite in quartz + K-feldspar veins occurred at 287° to 299°C. The H₂O-rich fluid inclusions of stage *II* were trapped at temperatures of 265°C. Sulphur isotopic studies were carried out on sulphides of stages *I* and *II*. The calculated $\delta^{34}\text{S}_{\text{H}_2\text{S}}$ in equilibrium with quartz + wolframite (*Ib*) fell in 5,2‰ from 300°C and $\delta^{34}\text{S}_{\text{H}_2\text{S}}$ in equilibrium with quartz + sulphide (*II*) fell in the range of 3,2‰ to – 1,5‰ from 250°C. These fluids correspond to those magmatic nature. Oxygen isotopic data were carried out on quartz of veins (stages *I* and *II*) and quartz of biotitic granite from San Martin Pluton. The veins show $\delta^{18}\text{O}_{\text{H}_2\text{O}}$ in 16,1‰ to 16,9‰ range and the granite presented $\delta^{18}\text{O}_{\text{H}_2\text{O}}$ value of 13,7‰.

The evolution of the hydrothermal fluid, during *Ia* and *Ib*, was a continue process with decrease of K and Mn and bearing of Fe and Ca with temperature, salinity and pH constants. The sulphur isotopic studies suggest that fluid evolved from neutral (stages *I*) to acidic and oxidant (stage *II*) conditions. The $\delta^{18}\text{O}_{\text{H}_2\text{O}}$ values of veins and granite suggest different source.

Palabras clave: Inclusiones fluidas - Isótopos estables - wolframio - Plutón San Martín

Key words: fluid inclusions - stable isotopes - tungsten - San Martin Pluton

ESTUDIO PRELIMINAR DE INCLUSIONES FLUIDAS DEL PÓRFIRO EL INFIERNILLO, MENDOZA, ARGENTINA

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ABSTRACT

El Infiernillo porphyry Cu - Mo deposit, located in the San Rafael Massiff, Mendoza, is hosted by Permian ignimbrites of the Cochicó Group. The alteration halo consists of a small central quartz neck surrounded by pervasive potassic alteration. Outwards there is a well-developed phyllic halo which consists of silicification, sericitization and pyritization. In the outer part of the alteration zone, small polymetallic veins crop out. Fluid inclusions studies carried out in samples from the neck, the potassic zone and polymetallic veins reveal the presence of high homogenization T and high salinity inclusions (type I, II and III) associated with early potassic alteration. Besides, low homogenization T and low salinity inclusions (type IV and V) were recognized in the veins and also in the quartz neck and the potassic zone, suggesting a magmatic plume collapse and a meteoric water influx in the hydrothermal system after the potassic stage.

Palabras clave: Inclusiones fluidas, pórfiro El Infiernillo, Mendoza

Keyword: Fluid inclusions El Infiernillo porphyry deposit, Mendoza

INCLUSIONES FLUIDAS Y MINERALIZACIÓN DE LAS VETAS LOS ESPAÑOLES Y LOS JESUITAS, ANTOFALLA ESTE, CATAMARCA

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ABSTRACT

Los Españoles and Los Jesuitas veins are located in an extended hydrothermal alteration zone, east Antofalla volcano, Antofagasta de la Sierra department, Catamarca province. The mineralization is more abundant in Los Españoles and consists in galena, sphalerite, pyrite, chalcopyrite, tetrahedrite-tennantite (with wt % Ag up to 12,20), idaite, covellite, hematite and cerussite.

Fluid inclusions analysis in quartz samples from Los Jesuitas indicates salinities between 0.9 and 3.1 wt % NaCl equiv., and homogenization temperature from 198 to 254° C; whereas samples from Los Españoles present salinities between 2.4 and 5.6 wt % NaCl equiv. and homogenization temperature from 226 to 264 °C.

All this data suggests that both veins were formed in an epithermal system, at depth estimated between 200 and 450 meters.

Palabras clave: Mineralización-Inclusiones fluidas-Los Españoles-Los Jesuitas-Antofalla Este-Catamarca

Key words: Mineralization-Fluid Inclusions- Los Españoles- Los Jesuitas- Antofalla Este-Catamarca

TEXTURAS MACROSCOPICAS EN VETAS EPITERMALES DE PUESTO CURIQUEO, SIERRA DE PAILEMAN, RIO NEGRO.

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ABSTRACT

Different textures observed in quartz veins of outcrops of Curiqueo epithermal deposit in El Jagüel District, at eastern of the Macizo Nordpatagónico and southeast of the Río Negro province, are recognized and classified according to the criteria proposed by Dong et al. (1995) for epithermal veins in Queensland, Australia.

The textures were studied by means of stereoscopic microscope on polished hand samples. The identification of the minerals that make up these veins was performed by optical microscopy, X-ray diffraction, scanning electron microscopy and analysis by electron dispersive energy. Macroscopic textures of primary crystallization, such as different kinds of banded, comb textures and laminar, parallel and stockworks replacement textures were defined. The relationships between these textures established different textural assemblages.

Palabras clave: texturas, depósito epitermal Curiqueo, Distrito El Jagüel.

Keywords: Textures, Curiqueo epithermal deposit, El Jagüel District.

GEOQUÍMICA DEL YACIMIENTO PEGMATÍTICO MARÍA DEL HUERTO, GRUPO VILLA PRAGA-LAS LAGUNAS, DISTRITO CONLARA, SAN LUIS, ARGENTINA

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ABSTRACT

María del Huerto pegmatite is located at 32° 31' 46''S and 65° 24' 17''W, 20 km west of Concarán, San Luis, Argentina. This deposit is part of the Villa Praga-Las Lagunas group, of the Conlara pegmatitic field. The pegmatite is hosted predominantly in a granodioritic lens; it has tabular form with NE-SW strike and sub-vertical dip. The internal structure shows from the margin inwards: border, wall, outer intermediate, inner intermediate and core zones; Ms replacement units and Qtz-Pl-Ms±Brl units have been recognized. The mineral assemblage comprises: Qtz-Pl-Ms-Mc-Spd-Brl-Grt-Ap-Tur-Dick-Ilm-Mn and Fe secondary oxides. According to the mineralogy and geochemistry features, this deposit is classified as a rare-element pegmatite of complex type and spodumene subtype. The K/Rb, K/Cs and Rb/Sr ratios in microclines and muscovite are in agreement with these results.

Palabras clave: pegmatita - geoquímica - microclino - muscovita -

Key word: pegmatite - geochemistry - microcline - muscovite -

CARACTERIZACIÓN DE LAS VETAS DE MINA LAS PICAZAS, BLOQUE DE SAN RAFAEL, PROVINCIA DE MENDOZA

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ABSTRACT

Las Picazas mine is an ore vein deposit located in the San Rafael Massiff, province of Mendoza, Argentina. It is hosted by ordovician-silurian schists and genetically linked to the gondwanic magmatism. The deposit consists of four veins with an ore paragenetic sequence of arsenopyrite – sphalerite/chalcopyrite – galena – pyrite- covellite.in a quazt gangue with typical epithermal textures. Strain fabric of the mineralized structures suggest that they are genetically linked to the Upper Choiyoi volcanic episode (Late Permian).

Palabras clave: Paragénesis de mena, alteración, vetas, Pérmico tardío, Bloque de San Rafael, Mendoza

Key words: Ore paragenesis, alteration, veins, Upper Permian, San Rafael Massiff, Mendoza

PETROLOGÍA

ANÁLISIS DE LA ZONACIÓN DE PLAGIOCLASA EN LOS FILONES TONALÍTICOS DE LA QUEBRADA DEL RÍO SUQUÍA, SIERRA CHICA DE CÓRDOBA

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ABSTRACT

Analysis of plagioclase zoning in the tonalitic dykes of the Quebrada del río Suquía, Sierra Chica de Córdoba

Tonalitic dykes are common in the area of the Suquía River valley (Sierra Chica de Córdoba). The studied sample comes from the La Gallinita quarry (31° 21' 25.7" S - 64° 20' 57.0" W); it lacks ductile deformation and has a porphyritic texture, with 2-mm long plagioclase phenocrysts set in a groundmass of ~0.5 mm. The rock is composed mainly of quartz, plagioclase and biotite [$\text{Fe}/(\text{Fe}+\text{Mg}) \leq 0.5$], with lesser amounts of microcline and calcic clinoamphibole (ferroedenite to ferropargasite, $\text{Fe}^{2+}/(\text{Fe}^{2+}+\text{Mg}) \leq 0.6$). Accessory phases are epidote, allanite, apatite-(CaF), zircon, pyrite, ilmenite (with up to 10.42% MnO) and titanite; chlorite, epidote (another generation) and muscovite are secondary minerals.

Plagioclase phenocrysts display two contrasting zoning patterns: a core with oscillatory zoning (An_{53} to An_{48}) and a rim with normal zoning, with sharply decreasing Ca content (from An_{50} to An_{14}). The oscillatory zoning probably formed in almost static conditions and minimal magmatic convection in the boundary melt layer. The sector with normal zoning most likely formed during the decompression and cooling that followed the intrusion of the magma in or near the final emplacement place.

Palabras claves: zonación de plagioclasa - Sierra Chica de Córdoba - tonalita - cristalización magmática.

Key words: Plagioclase zoning - Sierra Chica de Córdoba - tonalite - magmatic crystallization

VULCANISMO BASÁLTICO Y MESOSILÍCICO DE LA SIERRA DE LOS CHACAYS. PATAGONIA EXTRAANDINA. CHUBUT. ARGENTINA

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ABSTRACT

The mainly Oligocene Sierra de los Chacays Volcanic Complex (SCHVC) is characterized by its bimodal nature with a basaltic-trachytic association of alkaline character. This volcanic complex is stratigraphically bracketed between the Early Oligocene Pilcaniyeu Basalts and the Early Miocene Plan Luan volcanic event. The SCHVC volcanic sequence comprises an early basaltic event, followed by trachytic eruptions of varied textures and compositions and a posthumous basaltic stage. The basal basic lava flows are porphyritic with olivine and plagioclase phenocrysts. The most widespread facies within the SCHVC is represented by mesosiliceous rocks which were grouped into three petrographic types of trachytic lavas with characteristic alkaline mineral assemblages. The aphyric olivine-clinopyroxene-plagioclase -bearing basaltic lavas represent the final stage of the SCHVC.

Palabras clave: Patagonia - Sierra de los Chacays - Vulcanismo - Oligoceno

Key words: Patagonia - Sierra de los Chacays - Volcanism - Oligocene

PROCESOS DE FUSIÓN Y METASOMATISMO REGISTRADOS EN XENOLITOS DEL MANTO DE LA PROVINCIA DE LA PAMPA

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ABSTRACT

The clinopyroxenes of xenoliths from Agua Poca volcano (La Pampa) reveal two different behaviours. A group exhibits depletion similar to that produced by partial melting (1-5%). The other group displays depletion of heavy rare earth elements assignable to processes of partial melting (13%) and enrichment in medium to light rare earth elements attributable to metasomatism.

Palabras clave: xenolitos del manto - clinopiroxenos - fusión - La Pampa

Key words: mantle xenoliths - clinopyroxenes - melting - La Pampa

ESTUDIO COMPARATIVO DEL EFECTO TETRADA EN TIERRAS RARAS ENTRE LOS GRANITOS LA QUEBRADA, SIERRA DE MAZÁN Y SAN BLAS, SIERRA DE VELASCO, LA RIOJA

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ABSTRACT

The presence of the tetrad effect in granitic rocks, added to other geochemical characteristics allows to evaluate its evolution degree and the association with a hydrothermal system. Samples of rocks of the La Quebrada granite of the Sierra de Mazán and the central facies of the San Blas granite to the north of the Sierra de Velasco were analyzed, both of the La Rioja province. The application of this analysis in both granites allows to compare the magnitude of the tetrad effect between a body associated to Sn-W greisen deposit as La Quebrada granite and other with possible mineralization of the same type. Both present characteristics of peraluminous evolved granites with enrichment in volatile. The pattern of REE show in both cases the tetrad effect with values of $T_{1,3} = 1,228$ for the La Quebrada granite and 1,159 for a aplitic facies San Blas of the granite indicating the evolution degree of both granitic rocks associated to hydrothermal alteration and mineralization.

Palabras clave: tierras raras - efecto tetrada - Velasco - Mazán

Key words: rare earth - tetrad effect - Velasco - Mazán

PETROGRAFÍA Y GEOQUÍMICA DE LA FORMACIÓN ALCAPARROSA ENTRE LAS QUEBRADAS DEL SALTO Y DE LOS RATONES (SA. DEL TONTAL), SAN JUAN

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ABSTRACT:

Sandstones, limestones, carbonate sediments and basalts compose the main outcrops of Alcaparrosa Formation that appear along Tontal ranges (Precordillera). This area also has superimposed several secondary processes that effected all those units. Therefore, petrologic and geochemical studies have been done in order to characterized their original features as well as to determine all the secondary processes. Sedimentary rocks classify as litharenites that seems to be related to primary quartz arenites. They present interlayered beds of carbonates whose stable isotopes (^{13}C and ^{18}O) evidence marine waters precipitation. In according to their chemical signature, the studied volcanites were crystallized on mid ocean ridge. On the other hand, the secondary processes that affect all this area could be related to the metamorphism that produced the basaltic magmas crystallization or could be the consequence of the igneous activity that occurred during the Permian. The spatial association between those secondary minerals and the basaltic rocks, as well as their kind of assemblages, allows us to suggest that the first hypothesis must be the right one.

Palabras clave: Alcaparrosa, Tontal, Precordillera, Calingasta.

Key words: Alcaparrosa, Tontal, Precordillera, Calingasta.

LOS XENOCRISTALES DE OLIVINA Y LA EXTENSIÓN EN EL SUBSUELO DEL COMPLEJO MÁFICO – ULTRAMÁFICO OJO DE COLORADOS HASTA EL CERRO POCITOS. PROVINCIA DE SALTA. ARGENTINA

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ABSTRACT

The Cerro Pocitos is a Miocene stratovolcano located in the Puna geologic province. Samples of andesites of its NE sector present a variety of phenocrysts. Among them, pseudomorphous of a green mineral with perfect cleavage replacing olivine, are prominent. The aims of this study are to get the characterization of the olivine rests, and to identify the mineral that replaces it in order to interpret, in the geologic context, the processes that could give origin to their association. Olivine was identified as Fo_{86} . Its X-ray diffraction values and its chemical composition determined by microprobe, are presented. The mineral that replaces it was identified as antophyllite through its optic properties and a multimineral X-ray diffractogram. Other associate minerals are corrensite, tremolite-actinolite and magnesite. Petrogenetic considerations indicates that the antophyllite should have been equilibrated at temperatures of about 650°C under metamorphic conditions of the amphibolite facies, starting from peridotites, and that the olivine represents remains of their igneous protoliths. For these reasons they are xenocrystals in the andesites, and it is possible to relate them to the outcrops of a mafic – ultramafic complex named Ojo de Colorados, located 60 km to the south of Cerro Pocitos. In this Complex the olivine is altered to serpentine and tremolite, minerals that belong to greenschist facies. In consequence it is deduced that the Complejo Máfico -Ultramáfico Ojo de Colorados does exist in the underground of Cerro Pocitos, with a higher metamorphic grade than that of the southern outcrops, being the source of lithoclasts for the andesite. These lithoclasts would have been disintegrated by the magma and lava movements. The time elapsed from their incorporation to the magma until the cooling of the lava should have been brief enough for the antophyllite mineral not be destabilized to form cummingtonite. An origin by contact metamorphism for the antophyllite is not discarded. On the other hand, it is expected that the mineralogical characterization of the olivine xenocrysts will allow their comparison with those from other volcanics in the region, contributing to their petrogenetic interpretation.

Palabras clave: Puna, Mioceno, lava andesítica, xenocristales de olivina, antofilita

Key words: Puna, Miocene, andesite flow, olivine xenocrystals, anthophyllite

CARACTERIZACIÓN DE LAS ROCAS DE SKARN Y GREISSEN RELACIONADAS AL CONTACTO BASAMENTO METAMÓRFICO - GRANITO PAPACHACRA, CATAMARCA, ARGENTINA.

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ABSTRACT

The Papachacra Granite, in contact with Loma Corral Formation generates skarn and greissen rocks. They locate in Belén department, Catamarca province, centred on 45° S, 45° W. This paper deals with its geologic and geochemistry characterization. The Loma Corral Formation is low grade metamorphic rocks (metasedimentary, metavolcanic and marbles). Skarn constituent are epidote, muscovite, garnet, malaquite, pyrite, quartz and Fe oxides (mainly magnetite). There are two kinds of greissen rocks, a fluorite – magnetite ribbon rock (exo greissen) and the other, a quartz – sericite – topaz grissen. The geochemistry of skarns is lower Y, Th, U and REE, and higher Ba, Sr, Cr, Pb, Cu, Zn, V and Ti than the granite. Other values are Sn >2 <300, W >2 <20, Rb/Sr <2, Ba/Rb >1 <300, Th/U ≈ 5. Greissens have high values of As, Sb, Bi, Be, Li, Sn y W. Other values are Sn and W >20, Rb/Sr >1 <100, Ba/Rb >0,05 <0,5, Th/U >0,8 <11. Hidrothermal veins are high W, Cu, Pb (Zn) with Sn >10, W between 20 and 200 p.p.m.

Palabras clave: skarn, greisen, granito especializado, mineralización, geoquímica.

Key words: skarn, greissen, specialized granite, mineralization, geochemistry.

MICROANALISIS CUANTITATIVO DE LAS LAVAS MIOCENAS DE LA FORMACION CERRO DE LAS TORTOLAS, ALTA CORDILLERA DE SAN JUAN

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ABSTRACT

Upper and Lower Section of Miocene Cerro de las Tórtolas Formation andesites are characterized by plagioclase, orthopyroxene, clinopyroxene and amphibole phenocrysts. Microprobe analysis of these crystals show that their chemical composition is homogenous, which corresponds to their petrographical characteristics. Moreover, microprobe results show no significant difference between both upper and lower sections. Main difference between both andesites is related to the presence of tridimite and an increase of the modal content of amphibole in the upper section, which could be related to an increase in pressure and temperature condition of the magmatic chamber. Trace element analysis and preliminary geothermometry and geobarometry studies are consistent with these hypothesis.

Palabras clave: Microsonda, Cerro de la Tórtolas, volcanismo, Valle del Cura, petrografía

Key words: Microprobe, Cerro de las Tórtolas, volcanism, Valle del Cura, petrography

EVIDENCIAS DE MINGLING DE MAGMAS EN FENOCRISTALES DE PLAGIOCLASA

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ABSTRACT

Chemical and textural characteristics of plagioclase phenocrysts, dominant mineral phase in pliocene lavas at E-SE from Cerro Aracar, have been analyzed to understand and infer the magmatic processes that originate them. These rocks conform an extense outcrop of basandesite and andesite, and are considered to be originated by magma mingling. Two populations of plagioclase were recognized based on their texture and composition, the most common consists of clear phenocrysts and microphenocrysts that have oscillatory zoned patterns (60%). The other population consists of phenocrysts with a sieved interior enclosed by subhedral clear rims, with more calcic compositions than cores. This two populations of plagioclase crystals with distinctly different crystallization histories allow to infer that they did not grow in the same magmatic environment. Intrusion of mafic magma into a dacitic magma chamber could explain the different plagioclase textures and is consistent with replenishment events resulting in magma mingling that has played a dominant role in the petrogenesis of these rocks.

Palabras clave: mezcla de magmas – plagioclase – Puna - lavas pliocenas

Key Words: magma mixing – plagioclase – Puna - pliocene lavas

GEOTERMOBAROMETRÍA Y PROTOLITOS DE LAS METAMORFITAS DEL COMPLEJO COLOHUINCUL, LAGO ÑORQUINCO, CORDILLERA NORPATAGÓNICA

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ABSTRACT

The area of the Ñorquinco lake, 50 km west Aluminé city, is distinguished by the presence of isolated outcrops of medium to high metamorphic grade rocks accredited by amphibolites and gneises. These rocks compose the Upper Paleozoic Colohuincul igneous-metamorphic Complex. Through the fieldwork, the petrographical study and the use of a barothermic tool, the mineral assemblages and metamorphic facies are diagnosed to characterize the low P / high T metamorphism and establish a sequence of paragenesis from the medium- high to low grade. Four paragenesis are found for the amphibolites. The higher grade ones in amphibolite-granulite facies are developed by the associations: $\text{opx} + \text{cpx} + \text{pl} + \text{tsc}$ (equilibrated at 550°C and 4,7 kbar) and $\text{ed} + \text{act} + \text{ab} + \text{chl} + \text{ep}$. Subsequently, there are two overimposed re-equilibrated facies, the first under greenschist P-T conditions set up as $\text{act} + \text{ep} + \text{chl} \pm \text{ab}$ (450°C and 2,3 kbar) and the latter, under a prehnite-pumpellyite facies conditions defined by $\text{prh} + \text{pmp} + \text{chl} \pm \text{ab} + \text{ep}$ (300°C and 2,4 kbar). The proposed protolith for these amphibolites has a mafic to ultramafic affinity. Two paragenesis are recognised in the paragneises, the higher grade one in sillimanite facies is composed by $\text{kfs} + \text{sil} + \text{and} + \text{crd} + \text{bt}$, its equilibrium point was found at 1,8 kbar and 630°C, the other association, steady at temperatures below 250 °C, in the biotite zone is detected from $\text{chl} + \text{ms} \pm \text{bt} \pm \text{ab} \pm \text{cb} \pm \text{kl}$. Both lithologies show a progressive decrease in the temperature of the determined associations. This fact allows us to relate these events to three historical pulses barothermically different. The higher grade metamorphism (>600°C) in amphibolite- granulite facies and its local reversions, are assigned to an Upper-Paleozoic to Cretacic pulse, associated to the emplacement at different crustal levels of different plutonic episodes. South of the studied area, in San Martín de los Andes, this igneous activity could be represented by the igneous fraction of the Colohuincul Complex (previously referred as Huechulafquen Formation) and, in the concern area, by the intrusion of the Paso de Icalma Granodiorite, episode included in a regional event known as Patagonic Cordilleran Batholith. The lower grade event could play as an overimposed metamorphism linked to the Andean arc activity. This last event is able to be subdivided in two stages, Paleocene-Miocene (250-350°C) represented by the volcanic rocks of the Auca Pan Formation and Rancagua Basalt and a Quaternary stage (<250°C) associated to the Hueyeltué and Lanín basalts. This last event is associated to low temperature metamorphic processes with hydrothermal affinities. Regarding the tectonic environment of the Neuquen Andes it is considered that these changes in the steady mineralogy are consistent with a polyphasic metamorphism.

Palabras clave: Basamento Metamórfico- Geotermobarometría - Complejo Colohuincul-Andes Norpatagónicos

Keywords: Metamorphic Basament- Geothermobarometry- Colohuincul Complex- Northpatagonian Andes.

MANIFESTACIÓN GEOTÉRMICA MALLÍN DEL DOMO VOLCAN DOMUYO, ARGENTINA

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ABSTRACT

The characteristics of an area of geothermal alteration located in the vicinity of the El Humazo thermal manifestation are informed. The mineralogy of the alteration minerals of this area was analyzed and it is interpreted in relation to the characteristics of the fluids and the structural model of this geothermal field.

Palabras claves: alteración geotérmica, minerales secundarios, Vn Domuyo

Key words: geothermal alteration, secondary minerals, Vn. Domuyo

ACTIVIDAD RECIENTE EN LA MANIFESTACIÓN GEOTÉRMICA EL HUMAZO, Vn. DOMUYO, NEUQUÉN, ARGENTINA

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ABSTRACT

Geomorphologic and structural changes registered in the geothermal area of EL Humazo and its surroundings, in El Domuyo volcano geothermal field, are reported. It is proposed that these changes would be related to an explosive episode produced in this manifestation in 2003.

Palabras claves: Vn. Domuyo, El Humazo, episodio explosivo

Key words: Vn. Domuyo, El Humazo, explosive episode

IMPACTITAS DE TILIÁN, SALTA

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ABSTRACT:

Petrography and chemistry, the main characteristics of samples from Tilián-Chicoana, Salta, a probably like-impact extraterrestrial zone, are described. The samples show clear evidence of shock metamorphism which is reflected in the unusual mineral textures.

Key words: Tilián, impact, shock metamorphism, textures

EPIDOTO MAGMÁTICO: IMPLICANCIAS PARA EL ASCENSO Y EMPLAZAMIENTO DE PLUTONES TRONDHJEMÍTICOS. SIERRA CHICA DE CÓRDOBA.

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ABSTRACT

Epidote is frequently found in intermediate composition calc-alkaline granites, emplaced in relatively deep crustal levels. For some authors, magmatic epidotes differ from those with secondary origin because of their pistacite molecule content ($Ps = [Fe^{+3}/(Fe^{+3}+Al)] \times 100$). Moreover, textural differences are usually found between them. Magmatic epidotes are of considerable petrogenetic interest because they can be used to estimate the minimum depth of emplacement and to determine qualitatively the ascent velocity of granitic magmas.

Epidotes growing around allanite cores and isolated euhedric crystals are found in Calmayo and El Hongo trondhjemitic plutons from the Sierra Chica de Córdoba. Pistacite contents vary between 25 and 31 %mol. Thus, such textural evidences and the pistacite contents support magmatic origin for epidotes in these plutons.

According to structural studies in both plutons and the results of a gravity survey in the El Hongo pluton the ascent of magma took place through subvertical and nearly N-S striking feeder channels. The ascent finished when magma reached a buoyant equilibrium at intermediate crustal levels (~12 km). Epidote crystals not re-equilibrated with the trondhjemitic melts suggest fast velocities for the transport of these magmas. Such conditions are in line with magma transport by permitted, fracture propagation mechanisms.

Palabras clave: epidoto magmático - emplazamiento de cuerpos trondhjemiticos - Sierra Chica de Córdoba

Key words: magmatic epidote - trondhjemitic emplacement – Sierra Chica de Córdoba

UNAKITA EN EL BATOLITO DE SIERRA NORTE-AMBARGASTA, CORDOBA, ARGENTINA

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ABSTRACT

Unakite outcrops were identified near Cerro Baritina (29°38'- 64°05') and Caspi Cuchuna (29°47'- 64°04') in the northwestern region of the Sierra Norte-Ambargasta batholith, in the Eastern Sierras Pampeanas of Córdoba province.

The term unakite, originally applied to altered granites and gneisses of the Unaka Mountains (Tennessee, U.S.A), defines a metasomatic rock mostly composed of epidote and reddened K-feldspar, with minor opaque minerals and quartz.

In both studied areas of the Sierra Norte ranges, unakites are final products of alkaline metasomatism over monzogranite (Cerro Baritina) and granodiorite (Caspi Cuchuna), previously affected by brittle to ductile deformation.

The break-down of magmatic biotite and Mg-hornblende, and their replacement by chlorite and epidote represent the initial stage of alteration. Chlorite+epidote can be as much as 60% volume in the most altered zones of Cerro Baritina, however, epidote is absent in Caspi Cuchuna. Next alteration stage of localized occurrence (Cerro Baritina) is the formation of fibrous bunches of ferrohornblende-ferroactinolite-hastingsite. After a quartz-dissolution stage, alkali-feldspathization followed in the alteration sequence; these processes occurred in both areas crystallizing feldspars up to ~86% volume as blastic growth of microcline (52%) and as albitization of plagioclase (34%).

Minor phases that further characterize the Caspi Cuchuna area are the occurrence of titanite crystals that grow in cavities, and a second generation of chlorite and calcite as late vug-filling phases. At Cerro Baritina late-formed prehnite occurs as a replacement of magmatic plagioclase.

Metasomatic replacement and mineral crystallization at Cerro Baritina is sequentially represented by chlorite-epidote → amphiboles → desilicification + alkali-feldspathization; at Caspi Cuchuna the sequence starts with desilicification + alkali-feldspathization, followed by chloritization and carbonatization as a vug-filling stage. The processes that formed unakite as pervasive alteration of country-rock, could be genetically linked to those that originated sulfide-bearing quartz-chlorite-calcite deep epithermal veins present in the nearby region, as a result of lateral fluid diffusion from veins.

Palabras clave: metasomatismo alcalino - feldespatización - cloritización - unakita - Sierra Norte Ambargasta.

Key words: alkaline metasomatism - feldspathization - chloritization - unakite - Sierra Norte Ambargasta.

PEPERITAS TERCIARIAS EN LA PRECORDILLERA DE SAN JUAN

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ABSTRACT

In this paper we describe tertiary volcanic rocks previously not studied in the region. Their characteristics indicate that they are the result of the interaction of magmatic deposits with water soaked sediments.

Palabras Claves: Volcanismo, Terciario, Formación Cerro Morado, andesitas dacitas, peperitas

Key words: Volcanism, Tertiary, Formación Cerro Morado, andesite, dacite, peperite

QUEBRADA TRAMONTANA (SIERRA DE CALALASTE): EVIDENCIAS DE METAMORFISMO TÉRMICO EN CAJA DE ROCAS ULTRAMÁFICAS

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ABSTRACT

In southern Sierra de Calalaste, Quebrada Tramontana area heavily deformed sedimentary sequences (Complejo Sedimentario Volcánico Cortaderas Chicas) crops out jointly with ultramafic and mafic rocks (Complejo Básico-Ultrabásico Tramontana). Some authors hold that the second ones were tectonically emplaced into the metasedimentary sequence. Other regional researchers have recognized clots of biotite neformed and questioning the hypothesis of tectonic contact. However our study finds out clots of a prismatic and fibrous mineral of calc-silicate composition that grew in the country rock side between meta-wackes and gabbroid rocks due to the thermal effect of the basic intrusion.

Palabras clave: metamorfismo térmico - rocas ultramáficas - Sierra de Calaste

Key words: contact metamorphism - ultramafic rocks - Sierra de Calaste

LOS BASALTOS DEL COMPLEJO VOLCÁNICO BARRIL NIYEU

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ABSTRACT

The postshield Barril Niyeu Volcanic Complex (BNVC) is a Neogene eruptive building located at the SW corner of the Oligocene basaltic Somún Curá plateau. The BNVC is made up of pyroclastic and lava facies which span from basaltic through trachyte to minor rhyolite compositions. This paper deals with the petrographic and geochemical characterization of the basaltic lavas of the Complex; three main basaltic groups are distinguished: transitional basalts, alkaline basalts and trachybasalts; the former correspond to porphyric lavas with olivine and plagioclase phenocrysts and display the lowest $(La/Yb)_N$ ratio (9.6). The alkaline basalts occur mainly as porphyritic lavas bearing plagioclase, olivine and titanite phenocrysts; intermediate $(La/Yb)_N$ ratios (12-14) characterize this group. The last eruptive stage of the BNVC corresponds to the trachybasalts which appear either as lava flows or as spatter cones; rocks display aphanitic textures and the highest $(La/Yb)_N$ ratios (14-18) of the basic rocks. Evidences of upper crustal contamination and/or magma mixing processes are common both in alkaline basalts and in trachybasalts.

Palabras clave: Patagonia - Sierra de Chauchaiñeu - Barril Niyeu - Basaltos - Oligoceno

Key words: Patagonia - Sierra de Chauchaiñeu - Barril Niyeu - Basalts - Oligocene

PETROGRAFIA Y MINERALIZACIÓN DE LAS BRECHAS ASOCIADAS A INTRUSIVIDAD RIOLITICA EN LA QUEBRADA BLANCA, SIERRA DE LA HUERTA. PROVINCIA DE SAN JUAN

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ABSTRACT

A petrographic study carried out on two mineralized breccia bodies outcropping at Quebrada Blanca, in the southeastern end of Sierra de La Huerta, San Juan province, is presented. Based on their textural and compositional features, and the relationship with a rhyolitic intrusive body, these breccias are classified as “hypabisal breccia pipes” or “push-up intrusive breccias”.

Both breccia outcrops show disseminated sulfide mineralization (mostly pyrite and minor chalcopyrite and marcasite).

Palabras clave: brechas intrusivas * petrografía * mineralización * Sierra de La Huerta

Keywords: intrusive breccias * petrography * mineralization * Sierra de La Huerta