

evaluated for reliable geological interpretation of whole rock isochron ages.

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FIORI M.*, GARBARINO C.** , GRILLO S.M.** ,
MARINI C.*** , PRETTI S.** , URAS I.** -
*Polymetallic mineralization associated to the
leucogranites of Monte Arcosu*

A mineralization containing sphalerite and molybdenite, with minor chalcopyrite and galena, and traces of cassiterite, in quartz gangue, occurs at Nicola Tingiosu, in Monte Arcosu (Northern Sulcis, SW Sardinia); the ore bodies occur along the contact between Hercynian granite and Palaeozoic country rock.

The granite is white in colour, with medium to fine grain size, and is composed of quartz, alkaline feldspar, oligoclase and minor biotite. It looks similar to that described by BISTE (1981) from the Monte Linas batholith, in which similar ore occurrences, in a similar framework, have been reported (SALVADORI, 1958; GHEZZO et al., 1981).

The endocontact, which hosts the mineralization, is characterized by strong silicification, along with neoformed muscovite.

A detailed geochemical study was performed on the ore occurrences and the surrounding rocks, by means of XRF and electronic microanalyses. The samples were collected both along and across the contact.

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FLORA O.* , NEGRINI L.* , LONGINELLI A.* -
Isotope hydrology of the classical Karst area

Most of the Karst springs existing along the north-easternmost coast of the Adriatic Sea in the area of Trieste (Italy) have been studied for about three years for the isotopic composition of the water and, more recently, for some of the major and minor dissolved ions and for the water temperature. The isotopic composition of meteoric water has also been systematically studied during the same period to get information on environmental water. The isotopic curves obtained from springs generally show a marked seasonal isotopic inversion. In most of the studies springs the results obtained from winter samples are the most positive of the whole year.

On the contrary, summer samples normally show quite negative results, the most negative ones referring often

to the last summer months. The data obtained are considered the result of a variable mixing of waters from two main reservoirs. The less negative one may be formed by «local» meteoric water falling on the westernmost section of the Karst area whose elevation is about 400 m a.s.l. The most negative one is probably formed by meteoric waters falling on the Slovenian section of the Karst, whose mean elevation is about 800-900 m a.s.l. At least in the case of some of the northernmost Karst springs, it is likely that a third water system, basically fed by the Isonzo river, flowing north of the Karst highland, can interfere with the previously mentioned reservoirs, partially controlling the outflow of some of these springs.

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FONTAN F.* , ANTENUCCI D.* , FRANSOLET
A.M.* - *Investigations of the thermal
behaviour of triplite-zwieselite series phosphate
minerals from the granitic pegmatites*

Although the thermal behaviour of the phosphate minerals occurring in the granitic pegmatites is poorly known, a few available data, dispersed in the literature, show that an alluaudite-like phase is frequently reported after heating at 1000°C (FISHER, 1965; HUVELIN et al., 1972; FONTAN et PERMINGEAT, 1972). As the chemical composition of natural alluaudite s.l. is known to be versatile, we have attempted to investigate more systematically the thermal behaviour, and the reaction products of Fe-Mn phosphates belonging to an isomorphous series.

Selected samples of minerals of the triplite-zwieselite series (Mn, Fe)₂ PO₄F, with known chemical composition (the Mn/(Mn+Fe) ratios R, varying between 0.38 and 0.67) have been heated up to 1000°C, in air. Their heated products have been identified by X-ray diffraction afterwards. On the one hand when the starting material is a triplite characterized by R higher than 0.5, a beusite-like phase, with a graffonite structure type, is obtained, associated with hematite. On the other hand, heating of samples with a zwieselite composition (R lower than 0.5) gives a different phase, with an alluaudite type structure associated with hematite too. Moreover, heated in the same conditions, wolfeite (Fe, Mn)₂ PO₄(OH), from Hagendorf-Sud pegmatite, with R = 0.4, is transformed into an alluaudite-like compound, and wagnerite, Mg₂ PO₄F, from Bamble reacts to produce a farringtonite-like phase, Mg₃(PO₄)₂, mainly.

Before to envisage the thermal behaviour of the same mineral group in a controlled inert atmosphere, these experiments tend to show several interesting features on the chemistry of the artificial alluaudite-like phase, as well as in its formation conditions. As F and the OH groups are released during the heating, their ratios do not obviously affect the nature of the heated products. Since the alkali contents of the natural minerals used

as starting material are very low, their role is not crucial to determine the formation of the alluaudite-like compound. The nature, and the ratios of the major divalent cations of the starting material, however, seem to constitute a critical prerequisite during the reactions. Additionally, our experiments corroborate the important contribution of Fe in the trivalent state in the alluaudite structure type, as already claimed by MOORE (1971). It is also noteworthy to point out that zwieselite gives at 1000°C an alluaudite-like product without Na, and that wolfeite is transformed into and alkali-free alluaudite-like phase, both unknown in Nature.

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FUMEY-HUMBERT F.*, ORSINI J.B.* - *Role of mingling and hybridization in the genesis of composite dikes: the Capo Cavallo dike swarm, North-western Corsica*

During lower Permian, North-western Corsica has been the place of an important calcalkaline magmatism, which consists of:

- lava flows, ranging in composition from andesite to rhyolite. The intermediate composition lavas, contain dark microgranular enclaves (autoliths). Rhyolitic lavas, mainly ignimbritic, represent the last volcanic event;
- a dike swarm, composed of microdioritic to microgranitic rocks, which seems likely to be the feeding pipes of the lower Permian lavas.

In its western part, this dike swarm shows numerous composite dikes consisting of a central porphyritic microgranite (about 50% phenocryst), bounded on each side by microdioritic to microtonalitic dark margins. Microgranite and basic margins are both characterized by the presence of autoliths. The main feature of the dark margins is the existence of two different populations of plagioclase phenocrysts whose compositions are An 26% and An 80%.

The model we favour, is that a single magma mixing event takes place at depth, during the injection of an andesitic magma in a granitic magma chamber.

This mixing process leads at once to the development of basic pillows and then, as the physicochemical conditions evolve, to the formation of an hybrid magma.

This hybrid magma rises at first, and is followed by the microgranitic mush which eviscerates the still unconsolidated hybrid dike.

During its ascent, the hybrid magma undergoes flowage differentiation, and then in situ mechanical

interactions with the microgranitic core. These two processes induce compositional diversity of the dark margins.

Finally, in view of its great abundance of phenocrysts, the microgranitic magma would probably never have reached such a high level into the crust, without the triggering effect of the andesitic injection.

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GARCIA-CASCO A.*, PASCUAL E.*, FENOLL P.** - *Petrology of a cordierite-bearing monzogranite and leucogranite pluton of «Los Padroches» batholith, Hercynian Massif, Spain*

The Santa Eufemia pluton is part of the composite magmatic association of «Los Padroches» batholith, located in the southern branch of the Central Iberian Zone of the Hercynian orogenic belt of Spain.

This high-level, postkinematic batholith consists of three main types of plutonic rocks: biotite - amphibole granodiorites, biotite-cordierite porphyritic monzogranites and cordierite leucogranites, intruding one each other in the listed order.

The pluton consists mainly of monzogranites and in a lesser extent of leucogranites, both peraluminous in character. Different kinds of scarce enclaves are found only in the monzogranites. Biotite-plagioclase-cordierite and fine grained porphyritic monzogranite enclaves are considered as cogenetically related to the monzogranite facies (restites and autoliths, respectively). Enclaves of external origin are some hornfelse type ones and some of intermediate plutonic type related to the granodiorite facies of the batholith.

The structural, petrographical and geochemical study of the whole types of rocks shows a complex evolutionary story of the pluton. The differentiation mechanism that can be involved in the monzogranite suite are the degree of mixing between non-minimum melts and restite crystals (mainly biotite and plagioclase) and fractional crystallization. The restite-liquid mixing mechanism is deduced from the presence of the biotite-plagioclase-cordierite enclaves, which are interpreted, at least in part, as restite material. These enclaves have mineralogical characteristics very similar to the porphyritic monzogranites, excluding modal abundances, and geochemical anomaly in some incompatible trace elements (Li, Rb, Cs, Nb, Sn, W, Be, F) that suggest that the biotite is the main carrier of such elements in both the enclaves and the monzo-granites. So, the geochemical features of the monzogranites are interpreted as the result of a more or less modification of a monzogranitic parental magma, direct product of partial melting of a metasedimentary source region.

Their derivation from more basic magmas, such as the one which now represented by the granodiorite facies of the batholith, through processes of fractional