



representative straight lines for different series display similar slopes (though not identical) which indicate the alkali-lime relationships for each  $\text{SiO}_2$  content.

In order to avoid, as far as possible, extrapolation of regression-line values, the logarithm corresponding to a  $\text{SiO}_2$  content of 70% has been chosen. Application of the proposed representation system to several Iberian and Pyrenean granitoid associations has revealed: a) a marked geographic affinity of the series, showing a preferential cluster of the Pyrenees and Catalan Coastal Ranges units and, b) a similarity of the geochemical features of numerous units of the Iberian Massif, independently of their intrusion chronologies with respect to the Hercynian deformation phases.

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FERRARA G.\*, PETRINI R.\*, SERRI G.\*\*,  
TONARINI S.\* - *Sr and Nd systematics in the S. Vincenzo rhyolites and their magmatic inclusions bearing on the genesis of peraluminous granitic magmas*

The petrogenesis of peraluminous granitic magmas can be better investigated by studying very young acid glassy rocks in which primary isotopic, chemical and textural evidences are frozen in and not masked by ageing effects

and by re-equilibration during slow cooling. The S. Vincenzo cordierite low-silica rhyolites (4.7 Ma) and their mafic magmatic inclusions of latitic composition, which satisfy these requirements, have thoroughly investigated in terms of petrography, major element chemistry and Sr-Nd isotopes.

Two important processes have been recognized: 1) non-equilibrium anatexis of a pelitic source characterized by  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $^{143}\text{Nd}/^{144}\text{Nd}$  ratios of about 0.719 and 0.51217 respectively producing peraluminous rhyolitic melts with initial Sr isotopic ratio as high as 0.725 and leaving restitic cordierite, plagioclase, sillimanite, biotite, and perhaps garnet; 2) complex interactions between anatectic and K-rich mantle-derived magmas which can be modelled firstly as simple binary mixing. It is suggested that these two processes are common in the petrogenesis of granitic magmas.

The latitic inclusions have a minette-like texture and represent blobs of hybrid magmas formed in the mixing processes. Mixing calculation and isotopic composition of diopsidic clinopyroxene xenocrysts of the hybrid inclusions indicate Sr contents greater than 1550 ppm and  $^{87}\text{Sr}/^{86}\text{Sr}$  close to 0.7077 for the mantle-derived magma, which is in terms of isotopic and mineralogical feature interpreted as related to the Roman Province volcanism.

Whole rock isochron age of S. Vincenzo rhyolites (120 Ma) shows that Rb/Sr dating applied to old plutons can have residual bias even greater than 115 Ma. Non-equilibrium anatexis and mixing with non-cogenetic magmas as well as other processes producing significant heterogeneities at the time of emplacement must be

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 neofomed 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)<sub>2</sub> PO<sub>4</sub>F, 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)<sub>2</sub> PO<sub>4</sub> (OH), from Hagendorf-Sud pegmatite, with R = 0.4, is transformed into an alluaudite-like compound, and wagnerite, Mg<sub>2</sub> PO<sub>4</sub>F, from Bamble reacts to produce a farringtonite-like phase, Mg<sub>3</sub> (PO<sub>4</sub>)<sub>2</sub>, 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