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ABSTRACTS



experimental dependences $R(\sigma_s)$, got as result of calculations σ_s from σ , can be compared to theoretical models of crystal growth.

Analysis of $R(\sigma_s)$ data in the ranks of various growth models testifies about the cooperative character of crystal growth from solution. Furthermore, it is possible to evaluate quantitatively the contribution of different mechanisms. For example, the growth of octahedral faces of Al-K-alums is caused by mechanism of surface diffusion on 68% and direct jointing of particles on 32%. For prisma faces of ADP crystals and KDP dipiramidal ones the mechanism of surface diffusion is the main. Contribution of independant jointing of three-dimensional nucleus is not exceed 1-3% for the majority of studied crystals.

References:

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CELL PARAMETERS FOR Mg-, Al- AND Ni- SYNTHETIC END-MEMBERS OF THE COPIAPITE GROUP.

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The general chemical formula of the copiapite group minerals is $(A^{(II)}_{1-3x}A^{(III)}_{2x}\square_x)Fe^{(III)}_4(SO_4)_6(OH)_2 \cdot 20H_2O$, where the A sites are completely filled by divalent cations (Ca, Cu, Fe, Mg, Zn) for $x = 0$, or two-thirds filled by trivalent cations (Al, Fe) for $x = 1/3$. The only phase synthesized in laboratory up to now is the equivalent of ferricopiapite. Synthetic equivalents of magnesiocopiapite and aluminocopiapite and the Ni-analogue (not known from natural occurrences) were obtained for the first time by the following procedure: mixtures of *p.a.* salts in stoichiometric ratios were soaked in water and maintained at room conditions until complete drying. Unit-cell parameters obtained from X-ray powder diffraction data using the program WIN-METRIC® (Registered Trademark of Sigma-C) are listed in Table 1. The agreement is good when compared to data for natural magnesiocopiapite and aluminocopiapite (Bayliss & Atencio, 1985) while the data for the Ni-analogue are similar to those for the copiapite-group compounds. XRD studies on Zn-, Fe^{3+} -, Mn- and Co- end-members synthesized by us are in progress.

Table 1. Cell parameters for synthetic copiapite-group end-members.

	Mg	Al	Ni
a(Å)	7.364(2)	7.358(1)	7.345(2)
b(Å)	18.875(6)	18.889(3)	18.83(1)
c(Å)	7.357(3)	7.356(1)	7.399(2)
α°	91.65(3)	91.69(1)	91.50(2)
β°	102.55(2)	102.452(9)	102.60(2)
γ°	99.03(3)	99.13(1)	99.30(3)

Reference:

Bayliss, P. & Atencio, D. (1985). *Can. Mineral.*, 23, 53-56.

MINERALOGICAL AND PETROGRAPHICAL CHARACTERS OF THE BAHARIYA OASIS IRON ORES-BEARING MANGANESE MINERALS, WESTERN DESERT, EGYPT.

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ABSTRACT: The main purpose of this study is to shed some light on the iron-manganese mineral association in the Bahariya Oasis iron ore deposits in the Western desert of Egypt. About 50 samples collected from El-Gedida, Ghorabi and El-Harra areas were studied by means of a computer-controlled electron probe microanalyser and X-ray diffraction analysis. The main

manganese minerals identified are pyrolusite, pyrosmalite, ramsdellite, and other amorphous minerals. They are finely disseminated with hematite and goethite which are the most dominant iron-ore minerals of Bahariya Oasis. The grain size of the manganese minerals is usually less than 1 μ m in diameter. In some cases they occur as cavity filling or individual crystals.

PETROCHEMICAL FEATURES OF IGNEOUS ROCKS IN THE RARE-ELEMENT PEGMATITE FIELD OF ELBA, ITALY

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The famous rare-element granitic pegmatites in the island of Elba, in the Tyrrhenian Sea west of central mainland Italy, have been investigated since the 17th century. However, much of the abundant literature dealing with their mineralogy is outdated, and no meaningful information is available on their geochemistry and petrogenesis. Here we report the first petrochemical results of a comprehensive study of the Elban pegmatite field launched in 1990.

Two groups of igneous rocks are distinguished in the field. The plutonic GP (granodiorite-porphyry) suite constitutes the domal M. Capanne pluton of a relatively melanocratic (hb)-bi-granodiorite, locally with porphyry dikes. The leucocratic PEA suite consists of pegmatite, eurite and aplite dikes which crosscut the pluton, particularly on its eastern side where the pegmatites also penetrate its metamorphic envelope.

The A-Q-P (Le Maitre, 1989), Ab-Or-An (Kosinowski, 1981) and R1-R2 (De La Roche et al., 1980) diagrams classify the main plutonic rock as granodiorite, in part grading to monzogranite. The porphyries are monzogranitic, rarely quartz-monzodioritic. In contrast, all the PEA rocks show low Ca - monzogranitic to granitic compositions.

The $A=(Al-[K+Na+2Ca])$ vs. $B=(Fe+Mg+Ti)$ diagram of Debon & Le Fort (1983) and the A/CNK vs. A/NK diagram of Maniar & Piccoli (1989) sharply separate the GP suite of largely subaluminous granodiorites and sub- to metaluminous porphyries from the distinctly peraluminous PEA suite, in accordance with their respective mineralogies.

Chondrite-normalized REE abundances are virtually identical for both GP rock types: La_N averages at 80, La_N/Yb_N at ~13, with a moderate negative Eu anomaly and $Sm_N > Tb_N$ (except the LREE-enriched quartz-monzodioritic porphyry with La_N of 380). In contrast, the PEA suite has flatter patterns and lower LREE abundances: La_N of apfites, pegmatites and eurites averages at 16, 30 and 20, and La_N/Yb_N at 4, 6 and 7, respectively; Sm_N is slightly lower than Tb_N for all PEA rocks. The negative Eu anomaly is about the same as in the GP suite for pegmatites and apfites, but somewhat more pronounced in the eurites.

In terms of other trace elements, the PEA suite is poor in HFSE, LREE, Y, Ba and Sr, but enriched in Cs, Rb and in minor amount K, which however show considerable overlap.

Discrimination diagrams of Pearce et al. (1984) place both rock suites into the syncollisional fields. More significantly, the R1 vs. R2 plot of Batchelor & Bowden (1985) show the GP rocks trending from the pre-collisional (porphyries and some granodiorites) to the post-collisional (granodiorites) field, whereas the PEA suite fits late-orogenic parameters.

The post-collisional ranking of the granodiorites correlates with the post-tectonic (to anorogenic?) emplacement of the GP suite and related intrusions of the broader region. The melanocratic nature of most of the GP rocks, and their strong enrichment in Cs, and particularly Rb, correlate with their affiliation to the "aluminous-Ca-Fe" domain of Debon & Le Fort (1983), both features suggesting a hybrid, heterogeneous protolith. The currently available data suggest that the PEA suite did not fractionate from the GP-generating magma but has a separate line of descent.