COMPENCATION PHENOMENON - THE NEW KIND OF COMMUNICATION BETWEEN GEOLOGICAL OBJECTS. BECOMPENSATION

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The detailed analysis of chemical and isotope structure of minerals has allowed to reveal the new phenomenon, the so-called phenomenon of compensation. If concentration of elements are described by the equations of kind Y = AX + B in the presence of set similar extracts factors of these equations communicate parities B = gA + G, called the compensation equation [2, 3].

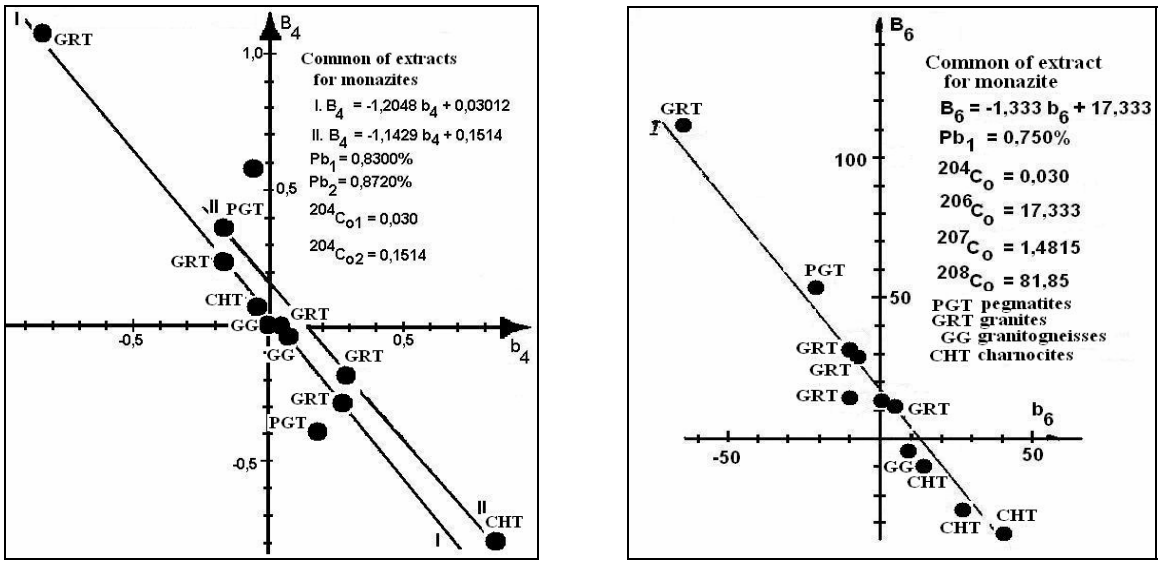

Fig.1. Compensation diagrams for monazite

Table 1

The summary table of the compensation equations in system Fe - Mg

№№ п.п.	Minerals	Rocks	N	g	G
1	Cpx	Gabbro	5	-0,1187	0,904
2		Alkarocks	6	-0,7934	0,156
3		Gneisses		-0,4654	0,561
	$G = 1{,}1069g + 1.0483;\ R^2 = 0{,}996$				
4	Bio	Gneisses	6	-2,1024	2,581
5		Gneisses	13	-2,0402	2,579
6		Granites of Belorussia	8	-2,1064	2,361
7		Granitoids	7	-2,6483	1,855
8		Granitoids	4	-1,6754	3,470
	$G = 1{,}6051g + 5.9632;\ R^2 = 0{,}9123$				
Note: Minerals- Cpx- clynopyrixene, Olv – olivine, Sch- spinele. N – quantity of extracts					

It is possible to allocate set individual extracts which substance arrives from one source; parameters of these equations are described by the compensatory equation; it samples become closed.

Similar samples we will name related, and the group we will name family related extracts (or family of

extracts). Examples of families of extracts are established in lead systems and resulted on fig. 1. Here the family, presented by breeds, and the family combined uraninites of uranium deposits is allocated. As we see, on parameters of the compensatory equations they differ, speaking about distinction of sources of their food.

Two families are revealed in neon systems [1]. The big material is collected on distribution of elements Mg, Fe, Ca, Na and K in biotite, to a garnet, pyroxene, olivine [4]**.**

Thus, each family is characterized by pair numbers. Therefore in the presence of more than two families of extracts construction of the compensatory equations named equation of bicompensation, and the phenomenon – bicompensation is possible. Set families extracts, described by the equation of bicompencation form an extracts sort.

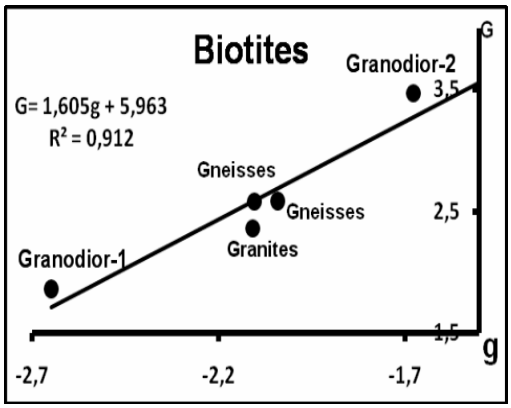

Fig.2. The diagramme of bicompensation in biotites of different rocks (gran-granodiorites)

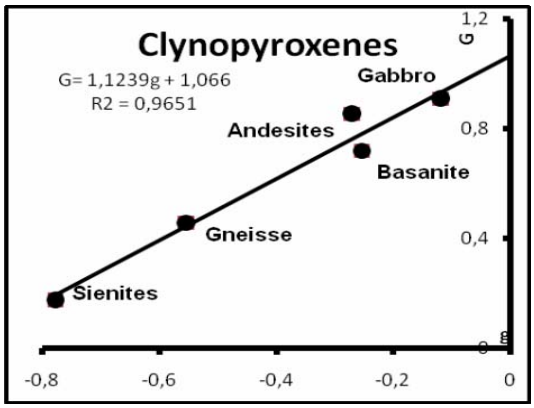

Fig.3. The diagramme of bicompensation in clynopyroxenes of different rocks. Shchel.por.-alkaline rocks (syenites and so forth)

Clearly, that in that case we study parameters of substance of deeper level III. For lead systems as a result of studying of the decision of a problem about mixture (substance sources) the equations presented to tab. 2 which allow to establish initial parameters of mixing up components on different on levels of depth. In geochemical systems the initial compensatory equations are resulted in tab. 1, and on fig. 2 and 3 diagrams of bicompensation for biotites and clynopyroxenes; on fig. 4 - for garnets.

Table 2

The received levels of depth substance sources on Pb-isotope data

Source of level I.	Source of level II.	Source of level III.
$^{i}C_M = b_i/Pb_M + {}^{i}C_{o1}$ (1а)	$^{i}C_{o1} = -(1/Pb_{o2}) + {}^{i}C_{o2}$ (2а)	$^{i}C_{o2} = d_i\,{}^{204}C_{o2} + {}^{i}C_{p3}$ (3а)
$^{i}C_M = a_i\,{}^{204}C_M + {}^{i}C_{p1}$ (1б)	$^{i}C_{p1} = -({}^{204}C_{o2})a_i + {}^{i}C_{o2}$ (2б)	и т.д.

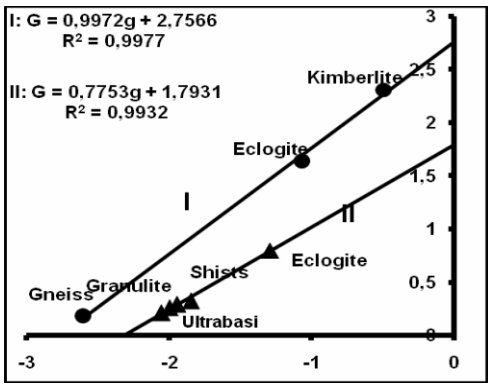

Fig.4. Diagrams of bicompensation for garnets

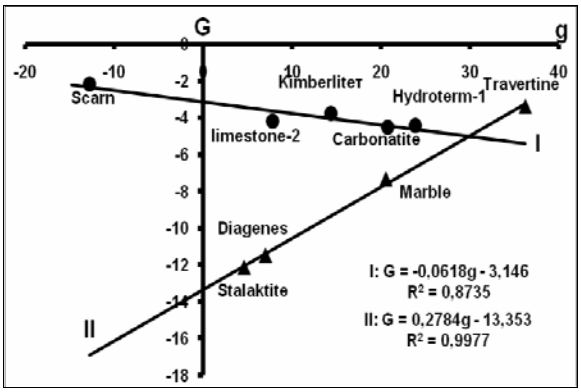

Fig.5. Diagrams of bicompensation for calcites

In tab. 3 compensation parameters for some genetic differences calcites and on fig. 5-constructed on these data are resulted in the diagram of compensation. According to these data in garnets and calcites come to light on two sorts of extracts.

Table 3

Summary data on values of initial parameters

№ п.п.	Family	Extracts	Quantity	Parameters of equation compensation		R^2
				g	G	
1	I	Carbonatites	28	20.85	-4.53	0.9854
2		Kimberlites	12	14.44	-3.77	0.9317
3		Scarns	8	-12.76	-2.17	0.9676
4		hydroterm-1	29	23.95	-4.42	0.918
5		Limestone-2	5	7.86	-4.20	0.8863
6	II	marble-2	7	20.60	-7.34	0.9381
7		travertine	3	36.27	-3.40	0.9717
8		stalactite	3	4.64	-12.13	0.9763
9		diagenes. c.	6	7.04	-11.48	0.7789
10		marble-1	13	-13.00	1.04	0.9922
11		hydrotern-2	4	7.13	-0.27	0.9606
12		limestone-1	7	4.34	3.02	0.9251

In geochemical systems interpretation of bicompensation is complicated. In essence the equation of bicompensation is identical to the equations individual extracts, and the angular factor the equations of bicompensation reflects only the relation of shares of mixing up elements in crystallochemical cell in a mineral of a source of level III. However in this case for calcites it is possible to speak about temperature of their forming in sources of level III. So for extracts calcites of the first sort it is estimated in 200^{o}C, for the second ~ 100^{o}C.

Thus, the following hierarchy of depth of substance source comes to light:

1. Individual extracts - level of depth I;
2. Compensation extracts - level of depth II;
3. Bicompensation extracts - level of depth III.

The analysis of sources of substance of depth level is completely described by the previous technique and defined only by quantity of an actual material.

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