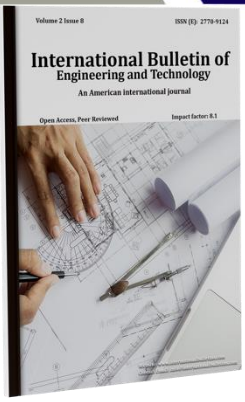

FEATURES OF THE DISTRIBUTION OF THE MAIN AND COMPANION ELEMENTS IN ROCKS SCATTERED IN THE SHAUGAZ-KONDIR SOY RANGE

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Due to the fact that copper is one of the main metals in the industry with a high need for its properties on a global scale, it is important to look for its manifestations and deposits in geology exploration. An important place in this regard is occupied by the identification of the conditions of copper formation and settlement laws through innovative technologies and modern methods of searching for minerals.

Key words: Shaugaz, Condir, Clark, correlation, metasomatite, granodiorite, limestone, tungsten, zinc, silver, telluric, andezite.

The Olmaliq ore field is located on the northern slope of the Beltau-Qurama volcanic-Plutonic belt, Qurama mountain range of the Tashkent region. Sediments, volcanic and intrusive deposits are widely developed in the area.

In recent years, new materials have been published that have made important corrections to the visions of the geology of the region. They were provided with the “geology and minerals of the Republic of Uzbekistan” under the editorship of T.Sh.Shoyokubov, T.N.Dolimov and b. “Evolutionary geology”, The Monographs “gold and copper metallogeny of Uzbekistan”, edited by A.A.Kustarnikova et al.

The effectiveness of geochemical search methods largely depends on the geochemical criteria and characteristics used to determine sampling results. The more criteria the prediction is based on, the more reliable it is. Based on the data of semi-quantitative analysis, a method of calculating a coefficient called order or degree correlation can be used to determine the relationship between different elements.

This method is characterized by Ease of calculation, and its application is not limited to the law of distribution, for example, let's consider the procedure for calculating the ordinal correlation coefficient between lead and silver content in endogenous oreols around polymetallic deposits.

Table 1
Calculation of the ordinal correlation coefficient

№	Pb quantity %	Production number		Ag quantity %	Production number		Average order number difference Pb-Ag Δ	Pb-Ag g/t squarei Δ^2
		initial	medial		initial	medial		
1	2	3	4	5	6	7	8	9
1	0,3	13	13,5	0,001	5	0,5	13	169
2	0,01	1	1,5	0,0003	1	2	0,5	0,25
3	0,1	6	8	0,003	9	11	3	9
4	0,03	3	3,5	0,03	14	14	10,5	110,25
5	0,3	14	13,5	0,001	6	6,5	13	169
6	0,1	7	8	0,001	7	6,5	1,5	2,25
7	0,1	8	8	0,003	10	11	3	9
8	1,0	15	15	0,1	15	15	0	0
9	0,1	9	8	0,003	11	11	3	9
10	0,1	10	8	0,001	8	6,5	1,5	2,25
11	0,01	2	1,5	0,0003	2	2	0,5	0,25
12	0,2	11	11,5	0,0006	4	4	7,5	56,25
13	0,2	12	11,5	0,003	12	11	0,5	0,25
14	0,03	4	3,5	0,0003	3	2	1,5	2,25
15	0,06	5	5	0,003	13	11	6	36
Summa Δ^2								584

$$R=1-\frac{6\cdot\Sigma d^2}{N\cdot(N^2-1)}$$

N- number of samples
$\Sigma d\Delta^2$-Pb-Ag square of the subtraction
R=1-((6*584) / (10*($10^{\cdot 2-1}$)) = -0.04; Pb-Ag = -0.04

In this case, the quantities given to us are numbered tamon from the smallest to the largest (as in Column 3), for example (Pb) we divide the ordinal numbers of two quantities from quantity 0.01 by one and divide by 2 (1+2=3/2=1.5) we write the average of the resulting result (in Column 4) and thus we.

We also calculate the quantities of the element silver (Ag) like the quantities of the element lead above (6-7 columns). In Column 8, we subtract the average ordinal numbers from one (Pb-Ag). In Column 9, we calculate the square of the mean subtraction (Table 1).

Table 2
Correlation of chemical elements in metasomatite rocks dependence (869 samples)

	V	Ag	Cu	Mo	Zn	As	Bi	W	Pb
V	1	-0,11	0,01	0,11	-0,07	0,22	0,49	0,52	0,21
Ag	-0,11	1	0,46	0,34	0,46	0,31	0,31	0,31	0,43
Cu	0,01	0,46	1	0,19	0,47	0,23	0,21	0,35	0,38
Mo	0,11	0,34	0,19	1	0,35	0,13	0,53	0,39	0,25
Zn	-0,07	0,46	0,47	0,35	1	0,24	0,21	0,31	0,43
As	0,22	0,31	0,23	0,13	0,24	1	0,36	0,38	0,31
Bi	0,49	0,31	0,21	0,53	0,21	0,36	1	0,57	0,34
W	0,52	0,31	0,35	0,39	0,31	0,38	0,57	1	0,53
Pb	0,21	0,43	0,38	0,25	0,43	0,31	0,34	0,53	1

In metasomatite rocks, copper forms a strong positive correlation with elements of zinc (0.47), silver (0.46), lead (0.38) and tungsten (0.35) (Rk-0.30) instead forming weak positive bonds with elements of copper arsenic (0.23), bismuth (0.21), molybdenum (0.19), vanadium (0.01) (Table 2).

Zinc forms a strong positive correlation with elements of silver (0.46), lead (0.43), molybdenum (0.35), tungsten (0.31) instead zinc formed a weak positive correlation with elements of arsenic (0.24), bismuth (0.21) as well as a negative correlation with zinc vanadium (-0.07) (Table 2).

Silver forms a strong positive correlation relationship with elements of lead (0.43), molybdenum (0.34), tungsten (0.31), arsenic (0.31), bismuth (0.31) instead forming a negative correlation relationship with silver vanadium (-0.11) (Table 2).

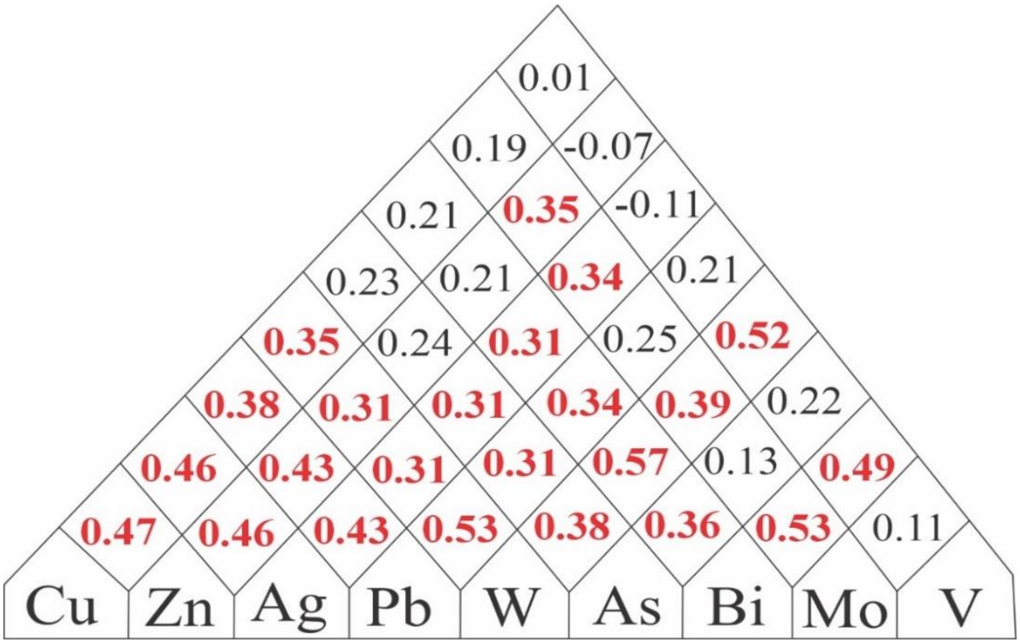

Fig. 1 Correlation correlation of chemical elements in metasomatite rocks (spectral analysis, n·0.001 %).

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Lead forms a strong positive correlation with elements of tungsten (0.53), bismuth (0.34), arsenic (0.31) instead lead has formed weak positive bonds with elements of molybdenum (0.25), vanadium (0.21) (Table 2).

Molybdenum forms a strong positive correlation with elements of bismuth (0.53), tungsten (0.39), zinc (0.35), silver (0.34) instead molybdenum formed weak positive bonds with elements of lead (0.25), copper (0.19), arsenic (0.13), vanadium (0.11) (Table 2).

Bismuth forms a strong positive correlation with elements of tungsten (0.57), vanadium (0.49), arsenic (0.36), lead (0.34), silver (0.31) instead bismuth formed a weak positive bond with elements of zinc (0.21), copper (0.21) (Table 2).

In limestone rocks, copper forms a strong positive correlation relationship with arsenic (0.69), zinc (0.66), tungsten (0.57), tin (0.56), molybdenum (0.52), lead (0.46), (Rk-0.40) rather than copper silver (0.23), which formed a weak positive bond with elements of bismuth (0.21) (Table 3).

Arsenic forms a strong positive correlation with elements of zinc (0.63), tungsten (0.62), tin (0.56), lead (0.58), molybdenum (0.52) instead arsenic formed a weak positive correlation with elements of bismuth (0.36), silver (0.28 (Fig. 11) (Table 3).

Table 3

Correlation relationship of chemical elements in limestone rocks

	Ag	**Cu**	**Pb**	**Zn**	**As**	**Bi**	**Mo**	**W**	**Sn**
Ag	1	0,23	0,27	0,07	0,28	0,4	0,54	0,35	0,48
Cu	0,23	1	**0,46**	**0,66**	**0,69**	0,21	**0,52**	**0,57**	**0,56**
Pb	0,27	0,46	1	0,33	0,58	0,18	0,39	0,64	0,53
Zn	0,07	0,66	0,33	1	0,63	0,04	0,42	0,37	0,45
As	0,28	0,69	0,58	0,63	1	0,36	0,52	0,62	0,56
Bi	0,4	0,21	0,18	0,04	0,36	1	0,56	0,2	0,37
Mo	0,54	0,52	0,39	0,42	0,52	0,56	1	0,42	0,64
W	0,35	0,57	0,64	0,37	0,62	0,2	0,42	1	0,62
Sn	0,48	0,56	0,53	0,45	0,56	0,37	0,64	0,62	1

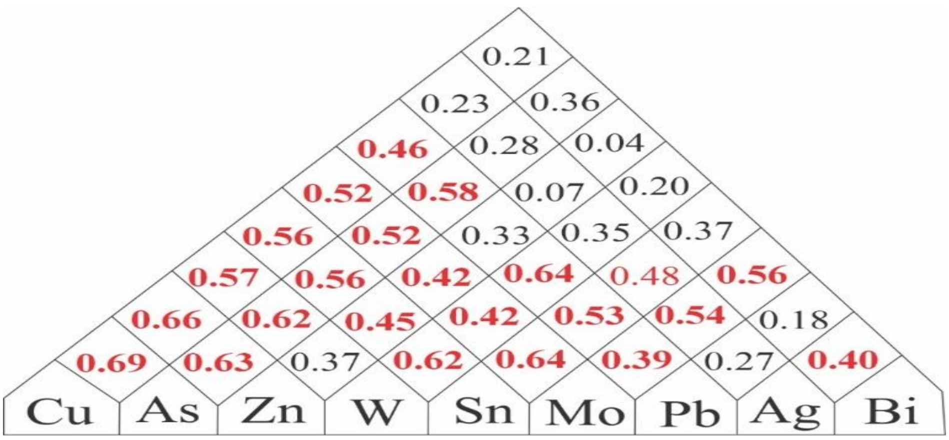

Fig. 2 Correlation relationship of chemical elements in limestone rocks

Zinc forms a strong positive correlation relationship with elements of tin (0.45), molybdenum (0.42) instead zinc formed a weak positive correlation relationship with elements of tungsten (0.37), lead (0.33), silver (0.07), bismuth (0.04) (Table 3).

Lead forms a strong positive correlation with elements of tungsten (0.64), arsenic (0.58), tin (0.53), copper (0.46), molybdenum (0.39) instead lead formed a weak positive correlation with elements of zinc (0.33), silver (0.27), bismuth (0.18) (Table 3).

Tungsten forms a strong positive correlation with elements of lead (0.64), arsenic (0.62), tin (0.62), copper (0.57), molybdenum (0.42) instead tungsten has formed a weak positive correlation with elements of zinc (0.37), silver (0.35), bismuth (0.20) (Table 3).

In granodiorite rocks, copper forms a strong positive correlation with elements of silver (0.89), gold (0.79), bismuth (0.79), selenium (0.71), lead (0.43) (Rk-0.40) copper forms a weak positive bond with elements of molybdenum (0.29), antimony (0.12), tin (0.07), arsenic (0.05) instead copper tungsten (0.05 -0.02), which formed a negative correlation with of tellurium (-0.08), zinc (-0.10), rhenium (-0.31) (Table 3).

Silver forms a strong positive correlation with elements of copper (0.89), selenium (0.59), bismuth (0.53), gold (0.50) (Rk-0.40) weak positive bond with elements of silver lead (0.38), molybdenum (0.20), tellur (0.11), arsenic (0.08), tungsten (0.05), antimony (0.03), cadmium (0.03) yields conversely silver tin (-0.05), zinc (-0.11), which formed a negative correlation with elements of rhenium (-0.41) (Table 4).

Gold forms a strong positive correlation with elements of bismuth (0.99), selenium (0.84), copper (0.79), silver (0.50), lead (0.57) and molybdenum (0.41). This is due to the presence in the studied Hudu of selinites, bismutin, chalcopyrite-galenite-molybdenite Minerals Association, in which gold is observed to correlate positively with the aforementioned elements (Rk-0.40) with gold tin (0.20), while surma (0.20) forms weakly positive bonds with elements instead of gold cadmium (-0.04), margimush (-0.06), tungsten (-0.08), zinc (-0.14), which produced a negative correlation with elements of rhenium (-0.20) (Table 4).

Bismuth forms a strong positive correlation relationship with elements of gold (0.99), selenium (0.86), copper (0.79), lead (0.58), silver (0.53), molybdenum (0.41) (Rk-0.40) bismuth forms a weak positive bond with elements of antimony (0.23), tin (0.19) - vice versa bismuth telluric (-0.02), cadmium (0.04), arsenic (-0.05), formed a negative correlation with elements of tungsten (-0.07), zinc (-0.15), rhenium (-0.21) (Table 4).

Table 4

Correlation relationship values of chemical elements in granodiorite rocks

	Cu	Bi	Pb	Zn	Cd	As	Sb	Se	Te	Au	Ag	W	Sn	Mo	Re
Cu	1	0,79	0,43	-0,10	0,00	0,05	0,12	0,71	-0,08	0,79	0,89	-0,02	0,07	0,29	-0,31
Bi	0,79	1	0,58	-0,15	-0,04	-0,05	0,23	0,86	-0,02	0,99	0,53	-0,07	0,19	0,41	-0,21
Pb	0,43	0,58	1	0,47	0,72	0,66	0,13	0,51	0,58	0,57	0,38	0,32	-0,03	0,31	0,03
Zn	-0,10	-0,15	0,47	1	0,83	0,49	-0,17	-0,15	0,31	-0,14	-0,11	0,08	-0,09	-0,11	0,28
Cd	0,00	-0,04	0,72	0,83	1	0,76	-0,07	0,00	0,62	-0,04	0,03	0,33	-0,07	0,07	0,20
As	0,05	-0,05	0,66	0,49	0,76	1	-0,02	0,09	0,76	-0,06	0,08	0,59	-0,07	0,17	0,12
Sb	0,12	0,23	0,13	-0,17	-0,07	-0,02	1	0,11	-0,07	0,20	0,03	-0,02	-0,23	-0,08	-0,19
Se	0,71	0,86	0,51	-0,15	0,00	0,09	0,11	1	0,05	0,84	0,59	0,08	0,33	0,51	-0,49
Te	-0,08	-0,02	0,58	0,31	0,62	0,76	-0,07	0,05	1	-0,04	0,11	0,46	0,01	0,12	0,10
Au	0,79	0,99	0,57	-0,14	-0,04	-0,06	0,20	0,84	-0,04	1	0,50	-0,08	0,20	0,41	-0,20
Ag	0,89	0,53	0,38	-0,11	0,03	0,08	0,03	0,59	0,11	0,50	1	0,05	-0,05	0,20	-0,41
W	-0,02	-0,07	0,32	0,08	0,33	0,59	-0,02	0,08	0,46	-0,08	0,05	1	-0,02	0,08	-0,07
Sn	0,07	0,19	-0,03	-0,09	-0,07	-0,07	-0,23	0,33	0,01	0,20	-0,05	-0,02	1	0,34	0,20
Mo	0,29	0,41	0,31	-0,11	0,07	0,17	-0,08	0,51	0,12	0,41	0,20	0,08	0,34	1	-0,11
Re	-0,31	-0,21	0,03	0,28	0,20	0,12	-0,19	-0,49	0,10	-0,20	-0,41	-0,07	0,20	-0,11	1

Zinc forms a strong positive correlation with elements of cadmium (0.83), arsenic (0.49), lead (0.47) (Rk-0.40). Zinc forms a weak positive bond with elements of tellurium (0.31), rhenium (0.28), tungsten (0.08) instead zinc forms a weak positive bond with elements of tin (-0.09), copper (-0.10), silver (-0.11), gold (-0.14), bismuth (-0.15), selenium (-0.15), formed a negative correlation with elements of Surma (-0.17) (Table 4).

Molybdenum forms a strong positive correlation with elements of selenium (0.51), bismuth (0.41), gold (0.41), tin (0.34), lead (0.31) (Rk-0.40) molybdenum with elements of copper (0.29), silver (0.20), arsenic (0.17), tellur (0.12), tungsten (0.08), cadmium (0.07 weak positive bond produces instead molybdenum which has formed a negative correlation with elements of antimony (-0.08), zinc (-0.11), rhenium (-0.11) (Table 4).

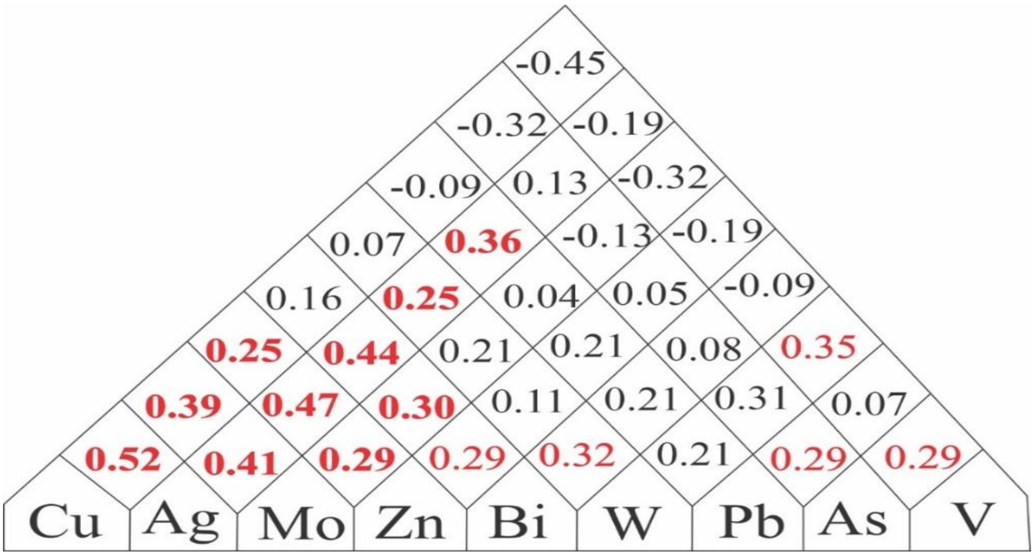

Fig. 3 Correlation relationship values of chemical elements in andesite rocks

For the observation of the chalcopyrite-molybdenite Association in andesite rocks, we can also observe that in our studied area copper forms a strong positive correlation with elements of silver (0.52), molybdenum (0.39) (Rk-0.40) copper zinc (0.25), bismuth (0.16), tungsten (0.07), and vice versa copper lead (-0.09) arsenic (-0.32), it can be seen that it forms a negative correlation with elements of vanadium (-0.45) (Table 5).

In andezite rocks, silver forms a strong positive correlation with elements of copper (0.52), zinc (0.47), bismuth (0.44), molybdenum (041) (Rk-0.40) silver crust (0.36), tungsten (0.25), and vice versa, arsenic (0.13) forms a weak positive correlation with the element silver vanadium (-0.19), which formed a negative correlation with the element (Table 5).

In andesitic rocks, molybdenum forms a strong positive correlation with elements of silver (0.41), copper (0.39) (Rk -0.40) molybdenum zinc (0.34), bismuth (0.30) tungsten (0.21), bark (0.04) instead forms a weak positive bond with elements of molybdenum arsenic (-0.13), vanadium (-0.32) formed a correlation relationship (Table 5).

Table 5

Correlation relationship values of chemical elements in andesite rocks

	V	Cu	Pb	Zn	As	Bi	Mo	W	Ag
V	1	-0,45	0,07	-0,19	0,29	-0,09	-0,32	0,35	-0,19
Cu	-0,45	1	-0,09	0,25	-0,32	0,16	0,39	0,07	0,52
Pb	0,07	-0,09	1	0,21	0,29	0,21	0,04	0,21	0,36
Zn	-0,19	0,25	0,21	1	0,05	0,29	0,34	0,11	0,47
As	0,29	-0,32	0,29	0,05	1	0,08	-0,13	0,31	0,13
Bi	-0,09	0,16	0,21	0,29	0,08	1	0,3	0,32	0,44
Mo	-0,32	0,39	0,04	0,34	-0,13	0,3	1	0,21	0,41
W	0,35	0,07	0,21	0,11	0,31	0,32	0,21	1	0,25
Ag	-0,19	0,52	0,36	0,47	0,13	0,44	0,41	0,25	1

In andesite rocks, lead forms a strong positive correlation with elements of silver (0.36), arsenic (0.29) (Rk -0.30) lead produces a weak positive correlation with elements of zinc (0.21), bismuth (0.21), tungsten (0.21), vanadium (0.07) and molybdenum (0.04) instead lead has formed a negative correlation with the element copper (-0.09) (Table 5).

High Clark concentration levels of elements such as copper, silver, bismuth, gold, molybdenum, arsenic have been identified in rocks in the area, as well as quantitative indicators of copper in various rocks and mines with elements of silver, gold, bismuth, lead, arsenic, gold with elements such as bismuth, lead, silver, molybdenum, have been shown to be used as a reliable geochemical marker in

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