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Ore deposits

NEW PERSPECTIVE GADIR MINERALIZATION FIELD IN GEDABEY ORE REGION

Academician of ANAS V.M.Babazadeh¹, A.A.Veliyev², Sh.F.Abdullayeva¹,
N.A.Imamverdiyev¹, S.M.Mammedov², J.R.Ibrahimov², A.A.Bayramov²

The article reviews the special features of the newly prospected Gadir ore-bearing field of the Gedabek ore district. Due to the conducted geologic research works, by bored wells, specifically high concentration of gold, silver, zink, copper and others has been detected, what proves the perspectiveness of the field. The internal structure and morphological features of ores reaches the type of pyrite ore mineralization. Element associations of Au-Cu-Ag and Au-Ag-Zn-Pb-Cu in ores are identical to those of the Gedabek deposits.

Keywords: Lessser Caucasus, Gedabey ore region, new perspective Gadir mineralization field

Gadir mineralization field is situated in 370 m to north-west from Gadabey gold-copper pyrite deposit (fig.1). Earlier few exploration

well were drilled in this field, geology of the area was studied superficially.

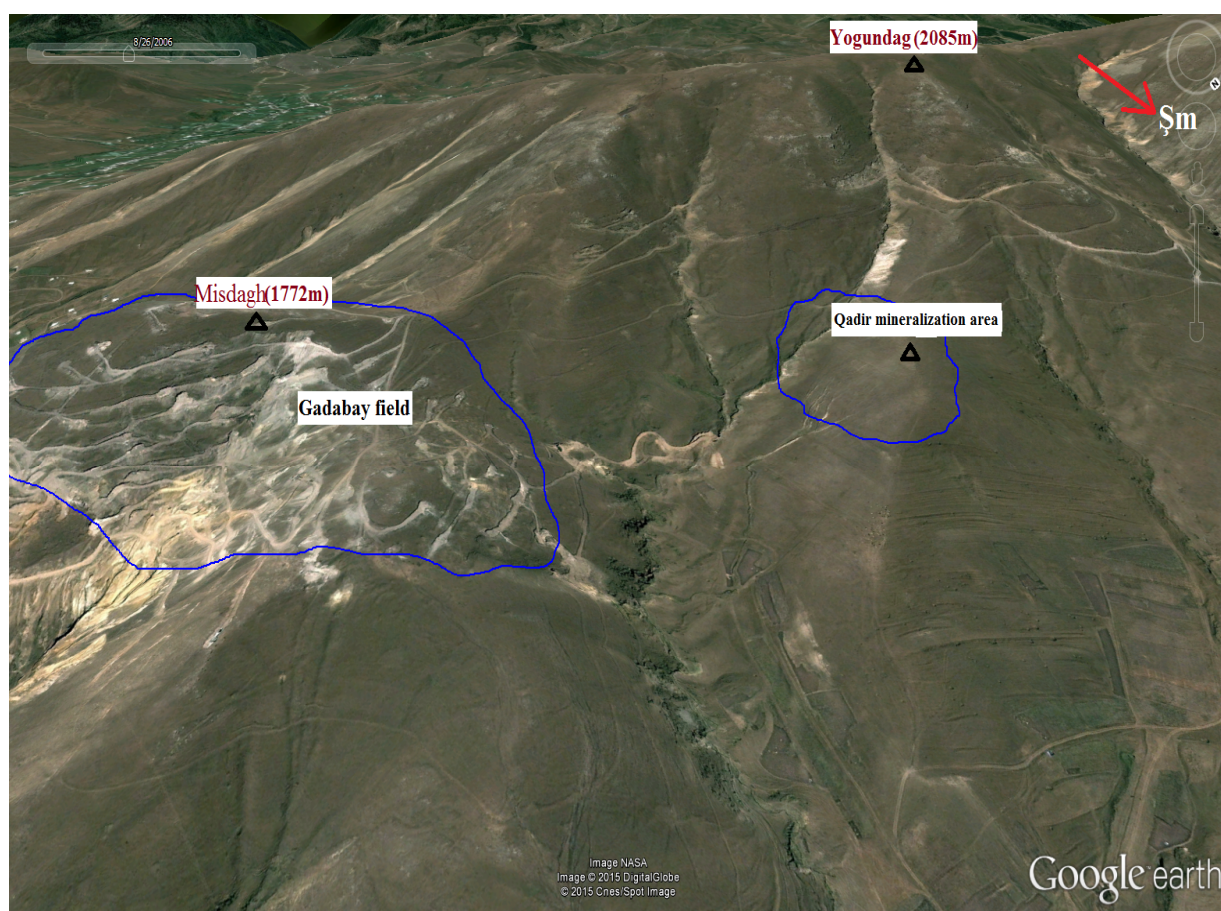


Fig. 1. Location scheme of Gadir mineralization field according to Gadabey deposit (by Google Earth program)

Mineralization field reminds horst, the north and south borders are bounded by width directed parallel fault zone. Upper Bajocian subvolcanic rhyolites, rhyolite-dacites, which split volcanogenic rocks of lower Bajocian, develop in west [1-3]. The rocks change in the contact zone (fig.2).

Some bore-wells have been drilled here by AIMKL company to define mineralization

of north-west flank (Gadir field) of Gadabay deposit in 2013. The first well No.86 cuts volcanogenic rocks of lower Bajocian in 0-223m and 254,2m – 666,0m intervals, ore-bearing origin quartz in 223,0 – 254,2 m interval. Some more wells have been drilled to define border and form of mineralization field after achieving positive results from bore-well. Their brief description is following lithologically.

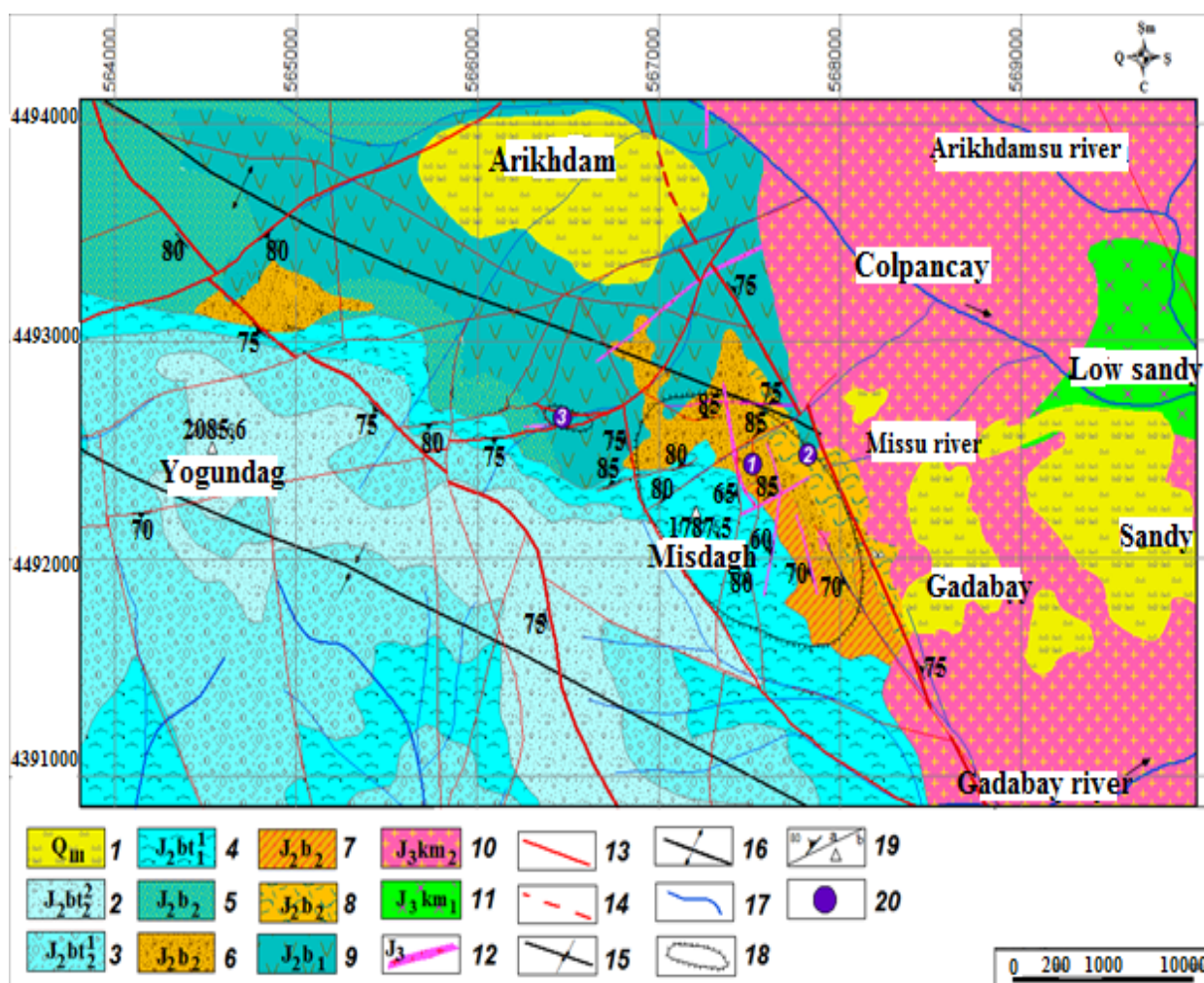


Fig. 2. Gadabay deposit and structural-lithological map of its north-western continuation; 1. Quaternary age sediments: eluvial-deluvial; 2. Bathonian upper volcanogenic layer - tuff, tuff-breccia, tuff sandstones; 3. Bathonian upper volcanogenic layer - andesite-bearing tuff breccia (fine-grained); 4. Bathonian lower volcanogenic layer - andesite bearing tuff breccias, tuff conglomerates; 5. Lava facie of Upper Bajocian rhyolites, riocacites; 6. Sericite-quartz facie of origin quartzites; 7. Amphibole-plagioclase-biotite-quartz facie of origin quartzites; 8. Pyroxene-plagioclase and epidote-plagioclase-quartz facie of origin quartzites; 9. Lower Bajocian volcanogenic layer - andesite bearing lava facie. Gadabay multiphase intrusive complex; 10. Diorite-granodiorite facie (the second phase); 11. Gabbro, gabbro-diorite facie (the first phase); 12. Diorite and quartz-diorite dikes; 13. Faults; 14. Supposed faults; 15. Arikhdam-Shakarbey anticline; 16. Yenikand-Godakdara synclinal; 17. Rivers; 18. Uplift; 19. a) Inclination angle; b) Height points; 20. 1-Gadabay gold-copper pyrite deposit; 2-Misdagh sulphur pyrite deposit; 3-Gadir mineralization field

Andesite porphyrites of lower Bajocian appear in 0-231 and 336-348m intervals, ore bearing origin quartzites in 231-336m of No. 106 well, which crosses in 20m to north-east from the first bore-well. Lower and upper contact of origin quartzites with volcanogenic rocks has changed into horn stone. Thin cracks, which developed in volcanogenic rocks, fill with carbonate veinlet in result of powerful metasomatism process happened in the upper contact. Xenoliths of volcanogenic rocks in shape of large and small sized tectonic breccia are noticed in the lower horizons of origin quartzites.

No. 106 bore-well has significantly increased the perspective idea of ore of the area in terms of either mineralization or cutting of origin quartzite in large intervals. This is why, the third bore-well (No. 107) has been drilled in 20m to south from No. 106 well. The well has cut andesite porphyrites of the lower Bajocian in 0-231 and 337-447m intervals, ore-bearing origin quartzites in 231-384, 295-315, 326-328.6, 330.4-332.5m intervals, pertified horn vascular rocks in 284-295, 315-326, 328.6-330.4 and 332.5-337m intervals.

Similar intervals are noticed in other drilled wells. If we analyse the rocks lithologically and by ore-bearing, opened by bore well, it is known that, subvolcanic mass (ore-bearing

origin quartzite) wedges to north falling at an angle of 45-60°. West and east wings of origin quartzites complicated morphology of ore mass thrown down to 15-20m by ore-ending faults. Ore mass is cut by No. 106 and 107 wells and notifies perspective of gold of Gadir mineralization.

Drilled No. 95 bore-well is situated in distance of 245m from 107th in the north-eastern part of field. Exploration well with 300m depth cuts andesite porphyrites of lower Bajocian: Rhyolite subvolcanic origins, which enriched accordingly with average value of 0.16 and 0.35 g/t gold, 2.68 and 2.63 g/t silver, 0.055 and 0.017 % zinc are met in 283,7-288 və 294-300m intervals. Enumerated these primary results show that mineralization zone stretches to north-east direction (fig. 3).

If we characterize the geological structure and ore-bearing of the field briefly, we can conclude that mineralization field is not bounded completely and beside wells, crossing of sloping underground mountain drillings is also advisable. For that reason, transition of addit (Gadir addit) has begun here since 2014. However, expanding of veinlet-porous ore fold and vein type mineralization in mineralization field is approved.

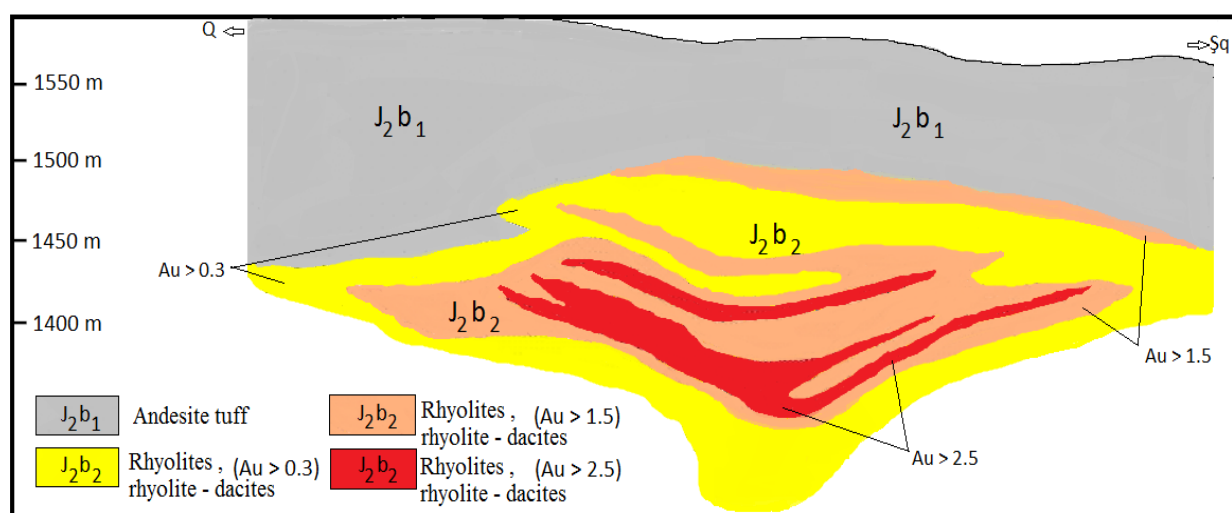


Fig. 3. Schematic description of Gadir ore mass



Fig. 4. a) veinlet-porous ore fold; b) vein type morphology of ore in hydrothermal changed subvolcanic rocks

Ore fold mineralization type prevails (Fig.4a). Intensive mineralization is observed in centre part of ore fold, the amount of gold and copper decreases away from centre gradually. Thickness of ore zone grows in intensive division and hydrothermal changing areas by formation of quartz-sericite facies of origin quartzite. Vein type of mineralization takes dependent position and is met exactly in origin quartzites; mineralization consists of quartz veins absorbed with sulphides here (Fig. 4b). Forementioned is very similar with known gold-copper pyrites and geological-structural peculiarities of copper-phosphryite deposits of Gadabay ore-magmatic system either morphologically or by inner structure of mineralization.

Amount of copper in Gadabay field is low in comparison Gadabay deposit (0.202-1.91%); it is true that, this indicator reaches to 2.38-3.61, even 5.54% in separate intervals. Average amount of gold is 3 g/t in origin quartzites. The highest indicator of gold is observed in cuts with copper more than 0.26 %. In some cases, although the amount of gold is less, the high rate of silver is noticed (26.9 g / t). Silver also cor-

relates with copper as gold; so, the maximum amount of silver concurs with high copper and gold bearing fields. Average amount of lead and zinc also is not less in such areas – 0.16 and 1.15% [4-5]. The main minerals of mineralization zone are pyrite, peacock ore, blende and galena [6] (fig. 5).

Pyrite prevails quantitatively in ores. It spreads in massive and porous ores, is met in shape of mineral aggregates with flat crystallinity structured. Peacock ore often forms combination with pyrite and blende. Peacock and pyrite form idiomorphic, drop-shaped, kidney-shaped and such segregation forms. Blende spreads widely too, keeps peacock ore segregation in composition, the size of its mineral aggregates is 0,01-0,03mm. Galena is observed in shape of mineral aggregates with separate, anomalous form, fills porosities of blende and peacock ore. In other words, galenite has separated from solutions later than peacock ore and blende and settled.

Minerals, which are typical for zone – hematite, goethite, hydrogoethite, limonite, pyrolusite and etc. are met in oxidation zone.

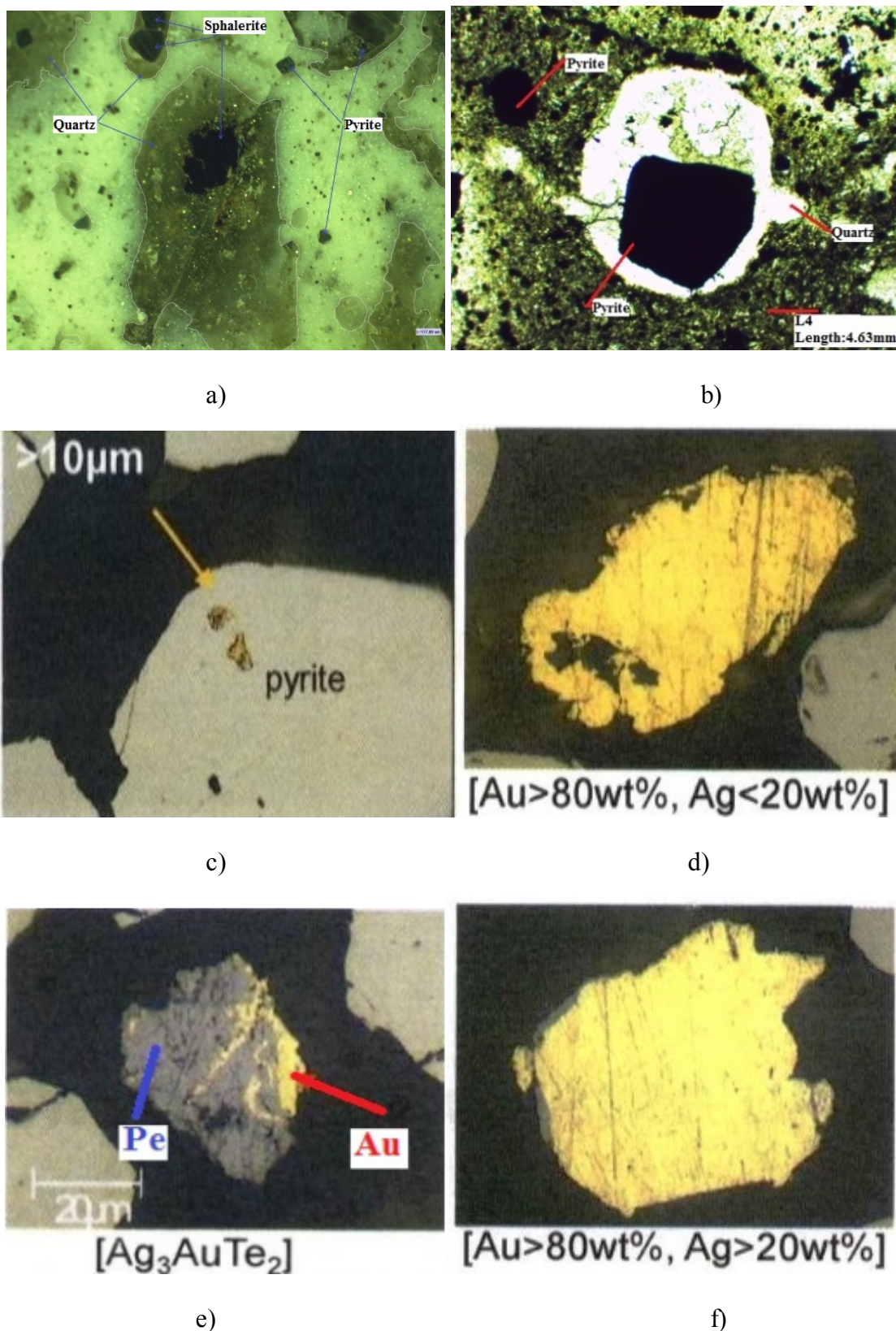


Fig. 5. a) blende crystal inside of quartz; b) pyrite crystal in quartz; c) gold grains in sulphides (pyrite, peacock ore, blende and galena); d) free gold grain; e) petzite; electrum. (The minerals are defined according to the results of SGS (Canada) and ALS (Ireland) laboratories)

We can come to following conclusion summarizing the primary information obtained in Gadir mineralization field:

1. Discovery of mineralization field, definition of the highest concentration of copper and especially gold in some cases increase the perspective of Gadabey ore region;

2. Inner structure, mineral composition and morphological peculiarities of ores show that it belongs to mineralization with sulphide type;

3. Mineralization is controlled by rhyolite, rhyolite-dacite subvolcanoes of the upper Bajocian, subvolcanoes turned ore-bearing origin quartzites in many cases;

4. Association of elements is also in Au-Cu-Ag, Au-Ag-Zn-Pb-Cu form in Gadir mineralization field in Gadabey deposit.

5. Unlike Gadabey deposits the ratio of Au/Ag is 1:7 in Gadir mineralization field, but this ration in Gadabey deposit is 1:10.

REFERENCES

1. *Baba-zadeh V.M., Musayev Sh.D., Nasibov T.N., Ramazanov V.G.* Gold of Azerbaijan. Baku, Az. Milli Enciklopediyası (Azerbaijan National Encyclopedia), 2003, p.424. (in Russian)
2. *Baba-zadeh V.M., Abdullayeva Sh.F.* Precious metallic ore-magmatic systems. Baku: Publish. house of Baku State University, 2012, p. 275. (in Russian)
3. *Baba-zadeh V.M., Akhmedov D.M., Ramazanov V.G. and others.* Mineral raw materials resources of Azerbaijan. Baku: Ozan, 2005, p. 808. (in Russian)
4. *Valiyev A., Talibov M.* About Gadabay ore area and Gadabay gold mine (Republic of Azerbaijan) Gold and Base Metal Deposits of the Mediterranean and the South Caucasus - Challenges and Opportunities. Tbilisi, Georgia, November 11-15, 2012.
5. *Valiyev A., Bayramov A., Mursalov S.* Geology, resource, and future ore perspective of the Gedabek gold deposit, Azerbaijan/Conference on Recent Research Activities and New Results about the Regional Geology, the Geodynamics and the Metallogeny of the Lesser Caucasus, Tbilisi State University, Georgia, 2013, p. 23.
6. http://www.lse.co.uk/shareregulatorynews.asp?shareprice=AAZ&ArticleCode=ty5brq0x&ArticleHeadline=New_High_Grade_Gold_Discovered_at_Gedabek_Mine.

¹ *Baku State University*

² *Azerbaijan International Mining Company*
inazim17@yahoo.com

GƏDƏBƏY FİLİZ RAYONUNDA YENİ PERSPEKTİVLİ QƏDİR FİLİZ SAHƏSİ

V.M.Babazadə, A.Ə.Vəliyev, Ş.F.Abdullayeva, N.Ə.İmamverdiyev, S.M.Məmmədov, C.R.İbrahimov, A.A.Bayramov

Məqalədə Gədəbəy filiz rayonunda yeni perspektivli Qədir filiz sahəsinin xüsusiyyətlərinə baxılır. Geoloji-axtarış işləri, xüsusilə də keçilən buruq quyuları vasitəsilə qızıl, gümüş, sink, mis və s. elementlərin yüksək miqdarı müəyyən olunmuşdur və sahənin perspektivli olduğunu göstərir. Filizləşmənin daxili quruluşu və morfoloji xüsusiyyətləri kolçedan tip filizləşməyə uyğun olduğunu göstərir. Filizlərdə Au-Cu-Ag və Au-Ag-Zn-Pb-Cu element assosiasiyası Gədəbəy yatağı ilə eynidir.

Açar sözlər: Kiçik Qafqaz, Gədəbəy filiz rayonu, yeni perspektivli Qədir filiz sahəsi

НОВОПЕРСПЕКТИВНАЯ ГАДИРСКАЯ РУДОНОСНАЯ ПЛОЩАДЬ В КЕДАБЕКСКОМ РУДНОМ РАЙОНЕ

В.М. Баба-заде, А.А. Велиев, Ш.Ф. Абдуллаева, Н.А. Имамвердиев, С.М. Мамедов, Дж.Р. Ибрагимов, А.А. Байрамов

В статье рассматриваются особенности новоперспективной Гадирской рудоносной площади Кедабекского рудного района. Геолого-поисковыми работами, особенно пройденными буровыми скважинами, обнаружены высокие содержания золота, серебра, цинка, меди и др., что свидетельствует о перспективности площади. Внутреннее строение и морфологические особенности руд сближают их с колчеданным типом оруденения. Элементные ассоциации Au-Cu-Ag и Au-Ag-Zn-Pb-Cu в рудах идентичны таковым Кедабекского месторождения.

Ключевые слова: Малый Кавказ, Кедабекский рудный район, новоперспективная Гадирская рудоносная площадь