Sequence stratigraphy of the Gurpi Formation in southwest of Firozabad area(Aghar anticline)

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Abstract

The study of planktonic foraminifera of the Gurpi Formation in southwest of Firozabad (Aghar anticline) area led to recognition of eight biozones that include: Dicarinella asymetrica Zone (Santonian to Earliest Campanian), Globotruncanita elevata Zone (Early Campanian), Globotruncana ventricosa Zone (Middle to Late Campanian), Radotruncana calcarata Zone (Late Campanian), Globotruncanella havanensis Zone (Late Campanian), Globotruncana aegyptiaca Zone (Late to Latest Campanian), Gansserina gansseri Zone (Latest Campanian to Early Maastrichtian), Contusotruncana contusa and Racemiguemblina fructicosa Zone (Early to Late Maastrichtian). In study area, the Gurpi Formation overlies the Ilam Formation with disconformity and is overlain by the Pabdeh Formation with disconformity. Based on distribution of morphotype groups of planktonic foraminifera, planktonic foraminifera per benthic foraminifera rathio (P/B) and content of carbonate, seven third-order sequences are recognized. Sequence boundries of the Gurpi Formation with the Ilam Formation at the base and with the Pabdeh Formation at the top, are SB1, but other sequence boundries are SB2.

KeyWords: Gurpi Formation, Planktonic Foraminifera, Sequence Boundry, Sequence Stratigraphy, Morphotype.

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Evaluation of Engineering Geology of Isfahan Quaternary Deposits, using Isfahan Geotechnical data bank

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Abstract

Every year, a large number of boreholes are drilled in various areas of Isfahan city and numerous tests are undertaken to determine the characteristics of engineering geology of Quaternary deposits. Unfortunately due to the lack of an organized plan the results of these geological tests are not used in the projects that follow. Nowadays, geotechnical data banks in different countries have already led to a computerized and organized plan. This project aimed to make a database in the third traffic zone in Isfahan Through the retrieved finding in various drilled boreholes of civil engineering projects. The database includes 300 boreholes features, 11093 records and 38 fields. The access, which has capability of special search, has been utilized, then data were analyzed by Surfer and a variety of specified maps were drawn. The statistical method to analyze the data was inverse distance to power. Based on such maps, the geological characteristics of Quaternary deposits were examined; the soil of studied area is most inactive. The depth of bed rock south to north increased. Therefore, regarding the borehole data, it is possible to recognize the fault in some part of Isfahan city. To obtain quantities and qualities results on geological characteristics of alluvial deposits, the development of a database is recommended.

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Relashenship Between Erosional type and Physico-Chemical Properties of Hamedan Marls

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Abstract

Due to high erosional sensitivity of marls, thousands of tons of fine grains sediments and clayare send to reservoirs of dams and artificial feeding stations annually. This process increases the expenses of filteration of drinkable water and forwards settlement of artificial feeding water strongly, Therefore, the study of different dimensions of marls is important for specialists and researchers. In this project, attempts were made to recognize effective variables of erosional features and some models were produced for classification and their erosional tye. Accordingly, 49 samples of marly soils belonging to 41 erosional points were taken and were send to laboratory for determinig of amount of physico-chemical variables. Also, characteristics of sampling place such as slope, Geographical situation, privilege of 7 parameter for soil surface factor and so on were noted. The test of artificial rain was done by kampHorst´s rainfall simulator apparatus in the 41 mentioned points and 41 samples were taken and the amount of runoff and sediment of them were measured by simple method in the laboratory. Furthermore, the 7 samples of marls were analyzed by X-ray diffractometer and the 8 thin setions of marls and their accompaniment rocks were provided and studied by polarizing microscope. Then, the abnormal data were normalized by logarithm and afterwards the all data were evaluated by variance and discriminant analysis. Evaluation of relationship between measured variables and erosion features showed that pH is only variable whose amount makes a significant difference and is effective for recognition of erosion features and sensibility of fisher´s linear discruminant functions for prediction of erosion features together with all chemical, all physical and all physico- chemical variables are orderly equal with 75.6%, 82.9% and 78%. This shows that the physical variables are more usefull than chemical and physico-chemical variables for prediction of erosiolal features. The finally,in this research, several fisher´s linear functions were produced for prediction of erosional type of Hamedan marls through these analysis .

Keywords: Marl, Erosional Type, Rainfall simulator, Hamedan

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Structural analysis of Zangul and Posht-e-Jangal anticlines in NW of Lorestan zone, Zagros fold-thrust belt, for estimation of oil closure on Dehram horizon

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Abstract

Zangul and Posht-e-Jangal anticlines are located at the WNW of Khorram Abad city, in Lorestan zone of Zagros fold- thrust belt (ZF-TB). Generally, folds in the ZF-TB are governed by thrust faulting. Therefore, the structural geometry of the folds, influence on the potential of reservoir structures, is controlled by thrust faulting which are almost blind and have no surface evidences. In this study structural geometry of the Zangul and Posht-e-Jangal anticlines is carried out and their potential of the hydrocarbon reservoir is evaluated. For this purpose three structural traverses perpendicular to the fold axis are mapped and studied in details. Based on these mapping, three structural cross sections across the anticlines are constructed. Geometrical analysis of the anticlines showed that they have geometry similar to the geometry of faulted detachment folds. The main detachment surface responsible for folding of the Zangul and Posht Jangal anticlines are proposed to be a deep detachment surface in Cambrian shales. However, evidences of younger folding as "Rabbit ear" and Pseudo similar folds on the anticlines' limbs show that median detachment surfaces are also effective. Garu Formation which is one of the basic median detachment surfaces in the Lorestan zone is consider as the main factor on development of these folds in the limbs of the major anticlines. This detachment surface also controls the style of folding at surface from the structures of in the regional oil fields at depth which caused displacement on the location of their hinge zone from surface to depth. From the constructed structural contour map of the anticlines, vertical and horizontal closures of the Zangul and Posht-e-Jangal anticlines are estimated.

Keywords: Oil closure, detachment zone, structural analysis of anticlines, Lorestan zone, Zagros fold-thrust belt

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Slope Stability Analysis of Farahzad Landslide

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Abstract

The design of appropriate, cost-effective remedial measures requires a clear understanding of the processes that are causing the landslide. This understanding require a detailed site investigation, a reconnaissance of the landslide as soon as possible after it's occurrence can allow important observations of the processes involved. A key step in analyses of soil slope stability is measuring or estimating the strengths of soils. Slope failures provide a valuable opportunity to estimate the strengths of materials involved in the failure.Stability analyses are performed to back-calculate strengths that could have produced a failure . Back analysis of strengths has advantages over laboratory testing in that the scale is much larger and the materials are in their in situ state.Using site investigations and an appropriate method of analysis it is possible to develope a model of the slope at the time that is failed.In this paper Farahzad landslide have been studied by site investigations and then have been evaluate shear strength parameter from back analysis of failed slope.

Keywords: Farahzad landslide, slope stability, Back analysis, residual shear strength, weathered tuff

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Zarigan Granite, Magmatic or Metasomatic?

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Abstract

Zarigan and Chah-Chole granite bodies located at the north of Bafgh, southeastern Ardakan 1:250000 map, part of Central Iran microcontinent. These bodies vary compositionally from alkali- feldspar granite to syeno- monzo granite. They are leucocrat and subvolcanic, mineralogically mainly quartz- feldspathic with lack of mafic minerals. Various textures of magmatic, deformation, metasomatic, granophyric, graphic, mylonitic, cataclastic, myrmekitic, pertitic and replacement can be found in these granites. Geochemically these bodies indicate calkalkaline to alkaline, peraluminous I-type characteristics and magmatic arc geoenviroment. They show different elemental behavior within variation diagrams, based on affinity, mobility and compatibility and intensity of tectonic structures and deformation, indicate the influence of both differentiation and metasomatic processes on the bodies. Field observations and petrographic and geochemical evidences on the Zarigan and Chah- Chole bodies indicate that at least part of those had formed from the earlier dioritic and gabbroic and pyroclastic rocks via metasomatism and hydrothermal differentiation processes, but after emplacement within the upper levels of the area, they also have been under the influence of these processes. The comparison of these rocks with criteria has been proposed for distinguishing magmatic and metasomatic granites, revealed that they share some characteristic features with magmatic bodies, but of course especially Zarigan granite has the most congruency with E-type or metasomatic granite.

Keyword:Zarigan granite, metasomatism, hydrothermal differentiation, leucocrat, Central Iran, north of Bafgh.

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Petrography and Petrology of Metapelites in Middle Part of Sanandaj-Sirjan Zone (North of Golpayegane)

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Abstract

The metapelites of North of Golpayegan show that these rocks can be divided into four categories based on mineral assemblages: garnet- chloritoid- schist, garnet- schist, garnet- staurolite- schist and staurolite- Kyanite- schist. The appearance of chloritoid in garnet- chloritoid- schists shows green schist facies. Garnets in garnet- schists shows 3 stage of growth.

The appearance of staurolite in garnet- staurolite- schists signifies the beginning of amphibolite facies. petrological changes from garnet- chloritoid- schists to staurolite- Kyanite- schists shows the formation of this rocks in a prograde metamorphism. The thermodynamic study of these rocks shows that North of Golpayegan's metapelites were formed within a temperature range of 480 – 560°C and a pressure range of 1.6 – 4.1 kbar. These results are consistent with the minerals' paragenetic evidence and show that effect of metamorphism on North of Golpayegan's pelitic sediments is to lower amphibolite facies (Epidote amphibolite).

Keyword: Metaplite, Schist, Amphibolite, Golpayegane, Sanandaj – Sirjan Zone

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Verifying Muteh Gold Deposit as an Intrusion Related Gold System (IRGS)

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Abstract

The Muteh gold deposit located in the center of Sanandaj-Sirjan Zone (SSZ) in western Iran. Gold mineralization is related to series of quartz and quartz-sulfide veins, lenses and veinlets, cutting the Neoprotrozoic crystalline basement rocks, along a NW-SE trending shear zone. Gold mineralization is closely associated with hydrothermal alteration along the ductile shear zones, with a typical greenschist facies assemblage of quartz+sericite+chlorite+albite, plus sulfidation and silicification alteration zones adjacent to ore body. Ore minerals include; pyrite, chalcopyrite, emplectite (Cu-Bi sulfide), arsenopyrite, pyrrhotite, bismuth, gold and subordinate galena and sphalerite. Native gold occurs in the quartz veins and adjacent to wall rocks as inclusions in the second generation of pyrite and chalcopyrite in form of fracture fillings within rim or around euhedral to subhedral coarse pyrite. Fluid inclusions in quartz veins contain carbonic, aqueous-carbonic and aqueous types in the Chah-Khatoon and Senjedeh gold mines. Homogenization temperature of CO_2 (Th_{CO2}) in carbonic inclusion is between 12.6 to 27.3 □C. Aqueous-carbonic fluid inclusions show salinities of 2.3 to 12.5 NaCl eq. wt% and total homogenization of 145.6 to 304.2˚C. The aqueous fluid inclusions, based on association with auriferous and barren veins categorized as; 1) salinity of 2.1 to 15.2 NaCl eq. wt% and total homogenization of 212.2 to 297.6˚C in auriferous quartz-sulfide veins, and 2) salinity of 16.2 to 28.2 NaCl eq. wt% and total homogenization of 147.4.2 to 245.6˚C in barren quartz veins. While most of aforementioned characteristics of the Muteh deposit are consistent with orogenic (mesothermal) gold deposit, but features such as genetic linkage with tectonic evolution of lithospheric mantle through upper crust with the tectono-magmatic history of SSZ accompanied with extensional structure setting, ore geology style, alteration assemblages, mineral chemistry, vertical elemental zonation and fluid inclusions characteristics presented in this research, it may inferred that gold mineralization in the Muteh deposit can be favored as an reduced intrusion related gold system (IRGS).

Keywords: Gold mineralization, Muteh, shear zone, intrusion related gold system, fluid inclusion.

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Structural Modeling and Petroleum Volumetric Calculation of the Asmari Reservoir in Shadegan Oilfield using RMS Software

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Abstract

The Shadgan petroleum oil field located in Dezful Embayment is a symmetrical anticline with 23.5Km length and 6.5Km width in the Asmari top horizon. The field trend is similar the regional Zagros trend. Asmari reservoir consisted of two separated reservoirs. The aim of the present study is to construct stratigraphy and faults models, reservoir quality evaluation, fault impacts and oil volume determination using RMS software. To construct the structural model, faults and reservoir zones data will be applied to design reservoir geometry. Stratigraphic and fault models revealed that the faults passed through the reservoirs but have not affected on their relations. This fact is verified by different petroleum API in two reservoirs and their independent pressure variations as well during production period. With correlation of faults, porosity distribution and reservoir volume models, it was revealed the fault effects in the reservoir properties quality.

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