

CONTRIBUTION TO THE STRUCTURAL EVOLUTION OF THE SHARI PLAYA – CENTRAL IRAQ

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ABSTRACT

Shari playa is an elongated N – S depression located about 35 km NE of Samarra city, central Iraq. A combination of the bands 2, 3 and 4 of the Landsat imagery was used to study the structural lineaments and water seepage analysis. Three sets of principal lineaments were detected. They are oriented in NW – SE, NE – SW and N – S; they may reflect faults or fault systems. The NW – SE direction is affected by the nearby Hemrin Mountain and also by the Pre – Miocene deep seated faults. The NE – SW direction is parallel to that of Greater Zab and Lesser Zab Rivers which are also parallel to the Amij – Samarra – Halabcha deep seated fault, which intersects Shari playa. The N – S direction is parallel to the proposed Tigris Fault. These fault systems are responsible for the water seepage in the playa. The stresses applied in the region probably activated movements along old lineament systems, resulted in the formation of a graben structure in Shari playa area. The estimated age of the playa is about 6000 – 6500 years B. P.

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FAULT GEOMETRY AND DEPTH OF DETACHMENT IN ANAH GRABEN – WEST IRAQ

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ABSTRACT

Fault shape at depth and the depth to the corresponding detachment were estimated from calculating bed length and excess area balance in cross – section and graphically from associated hangingwall roll – over fold profile.

Six different construction techniques were used on the same initial cross – section which is derived from converting a chosen seismic profile to a true depth section with equal vertical and horizontal scales. The graphical construction techniques include Chevron, modified Chevron, inclined shear, constant – slip, and flexural – slip models. Because these construction models vary considerably, since they assume different mechanisms by which the hangingwall deforms, the resultant fault shapes and their corresponding detachment depth differ according to the construction technique used. Therefore, the geometric construction models cannot provide a unique answer about the geometry of a listric normal fault at depth and the depth at which it flattens, particularly in areas of limited seismic and well data. They may define a range of possible solutions. However, the constructions show that the fault soles at deep level irrespective of the technique used. The results show good agreement with the available geophysical and geological information.

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THE INFLUENCE OF UNSTABLE SLOPES ON THE STABILITY OF MAKHOOL DAM – CENTRAL IRAQ

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ABSTRACT

Makhoool dam (under construction, which is stopped neither to) is located on the Tigris River about 30 km northwest of Baiji town. The reservoir extends to Sharqat vicinity. The exposed rocks within the reservoir area belong to the Fatha and Injana Formations. The former consists of marl, claystone, limestone and gypsum in cyclic nature. Whereas, the latter consists of claystone, siltstone and sandstone, in cyclic nature too. The western limits of the reservoir are bounded by scarps which belong mainly to Makhoool and Khanooqah anticlines. Major parts of these scarps suffer from unstable slopes, along them many mass movements are developed. Moreover, the scarps are potential areas for development of mass movements, which will increase after construction of the dam, due to major change in water level. This will consequently change the properties of the exposed rocks and soils in the banks of the reservoir. The expected mass movements will influence on the stability of the dam, especially if they took place together at once.

The slopes and scarps of the western limits of the reservoir are divided into five zones. For each zone different characters are mentioned with estimating conditional and average probability of landslides occurrence. Moreover, unique terrain units are defined.

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DISTRIBUTION OF CELESTITE IN KARBALA AND NAJAF AREA – CENTRAL SOUTHERN PART OF IRAQ

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ABSTRACT

A detailed geological survey in Karbla and Najaf area has been carried out by the authors and others including a lot of geological sections, traverses, document points and mapping, beside drilling boreholes, to investigate the origin and distribution of the celestite in the studied area. The work indicates that the main celestite deposit is concentrated as a narrow strip of about 200 m width along both Tar Al-Najaf and Tar Al-Sayyed, then decreases downwards within Karbala – Najaf Plateau. It is scattered along both tars (cliffs), either within certain areas, extending to many kilometers or within isolated sections, in very limited areas. Abu – Jir Fault is the main and the principle controlling factor on the distribution of the celestite, in the studied area in addition to the lithology, porosity and permeability.

The celestite has been found in the upper part of Injana Formation and the lower part of Dibdibba Formation within sandstone, siltstone or silty claystone beds, but more concentrated in the sandstone beds of Dibdibba Formation. It is differentiated in the field either by its heavy weight in a tough, cliff – forming siltstone or silty claystone beds or as colourless needle – shaped crystals in heavy, tough sandstone beds. Generally, three main horizons of celestite are present in different levels in both formations, but more horizons may be present in other areas. The celestite is formed from the combination of Sr from the deep ground water and the SO₃, which was supplied from the surrounding environment due to high ground water level and continuous evaporation. The thickness of the celestite – bearing beds ranges from (0.1 – 0.5) m. The Sr concentration is up to 34% whereas the celestite concentration is up to 74.8 %.

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DISTRIBUTION AND ECOLOGY OF RECENT MOLLUSKS IN THE EUPHRATES RIVER – IRAQ

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ABSTRACT

A reconnaissance survey in the Euphrates River from Al-Qaim to Nassiriya showed the following types of mollusks: *Corbicula (Corbicula) fluminalis* MULLER, *Unio tigridis* BOURGUIGNAT, *Mytilus* sp., *Bellamya* cf. *bengalensis* LAMARK, *Melanoides* sp. and *Melanopsis nodosa* FERUSSAC. The distribution of these mollusks is variable in the river basin; generally the pelecypods are common in the northern sector whereas the gastropods are found in the southern sector only. The most common species in the whole river is *C. (Corbicula) fluminalis* MULLER, followed by *Unio tigridis* BOURGUIGNAT. On the other hand, *Bellamya* cf. *bengalensis* LAMARK is the commonest species in the southern sector. The distribution of these mollusks in the Euphrates River seems to be controlled by water salinity, type of dissolved salts, speed of water flow, TSS, BOD and COD contents of the river water. The northern sector of the Euphrates River is characterized by faster flow, lower salinity, better aeration, lower TSS, TDS, BOD and COD concentrations and an HCO_3 , SO_4 , Ca, Mg water type. In the southern sector the river flow is slower and remarkably higher in TSS, TDS, COD and BOD concentrations relative to the northern sector.

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ALUMINA RECOVERY FROM IRAQI KAOLINITIC CLAY BY HYDROCHLORIC ACID ROUTE

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ABSTRACT

The extraction and recovery of alumina (Al_2O_3) from white kaolinite clay in hydrochloric acid solution was investigated on laboratory scale. The extraction rate was found to increase with calcination temperature (up to a certain limit), calcination time and acid concentration. Under optimum conditions of 720°C calcination temperature for 45 min with 28% HCl, by weight and 45 min leaching time at 100°C , alumina extraction was about 99 %. The recovery of alumina by gas (Hydrogen Chloride) precipitation technique has proven satisfactory and it was of about 93%, with purity of about 99.98% Al_2O_3 . This purity of the produced alumina was found in accordance with that of commercial grade, which is in the range of (99 – 99.5)% Al_2O_3 .

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BLACK CHERT, AN INTERESTING PETROGRAPHIC COMPONENT WITHIN THE UPPER PART OF SARGELU FORMATION (MIDDLE JURASSIC) – NORTH AND NORTHEASTERN IRAQI KURDISTAN

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ABSTRACT

Three surface sections of Sargelu Formation were chosen for the purpose of this study, Naokelekan village (near Rowanduz), Gara mountain (southern Amadia), and Banik village (northeast of Zakho) Northern Iraqi Kurdistan. At all these localities, the upper part of Sargelu Formation is characterized by interesting black chert beds.

The petrographic study of chert beds was based on 25 thin sections. This study revealed fossils similar to those described in limestone units of the same formation, but with clear signs of silicification. By combination of field observations and petrographic studies, it can be concluded that chert beds are formed by diagenetic reorganization of silica, which is mostly of biogenic origin, mostly from radiolarians. Complete replacement of some thin limestone beds (or thin parts of them) by silica resulted in the development of chert beds. Dissolution of radiolarians, either within chert beds or in neighboring limestone beds, provides a major source of silica for this process.

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