

SALT DEPOSITS OF IRAN

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Introduction. Presence of evaporate series from Precambrian to Quaternary is recognized in many locations of Iran which is. That traces are different from chronological aspect to determine stratigraphic indexes for salt sequences. Of course according to precise time of salt formation in some locations, this classification will have some problems. Moreover, all over the territory of Iran, with respect to the type of surveys and related classification, it is only one of classifications which is applied based on geographical, geological or oil explorations. In survey of mines or salt deposits in Iran, it seems that it is more suitable that they are surveyed with respect to their time scattering in various structural zones (mainly Zagros, central Iran and Alborz). According to these results the main purpose of this article is to overview of available publications related to salt mines in Central Iran and Zagros Range, with time span from the Late Precambrian to Tertiary.

Late Precambrian salts in Zagros Zone. Late Precambrian salts from Iran are located within late Precambrian rifts of the Arabian Plate. Present evaporate sediments are formed within South Iran and located in sedimentary basins having NS orientation from the east of the Arabian Plate in the direction of the Kerman–Yazd area (close to the Central Iran) between in between two long faults of Oman-Nayband and Qatar-Kazerun ones and the Hormoz Formation. These deposits are recognized as the platform cover on erosional surface which is resulted from the Baikalian folding and it belongs to Late Precambrian. Late Precambrian salt series are developed in the Bandar Abbas town as a diapiric province. Also it was a typical one for a geological section composed of salt, sedimentary and intrusive rocks in Hormoz Island and Hormoz Formation. Most of salt dome aggregations are located in southeast and middle parts of Zagros. Moreover Persian Gulf Island is in reality a salt domes which are outstand of the sea water surface. The Hormoz Salt Island, Abu Musa, Big and Small tonbs actually are salt domes. These salt domes represent folded deposits in Zagros Region which have been crossed by a fault. Though these salt domes are old but their outcrop is extended to some late times. Salt core forms major part of the dome in some parts, it seems that such domes as the salt dome in Hormoz Island and some other ones were uplifted completely exposed and now we can observe some examples, for instance the Gachin Salt Dome [3] (fig. 1).

Upper Jurassic salts. Sea depth is declined in most areas of Iran to Late Jurassic period and it results in creation of evaporate basins in some locations. As it is recognized, gypsum layers are located on Surmeh Formation and in coastal segments of Fars, Khuzistan and Lorestan states. There are some salt domes in north and east (North Kerman) that these roots originated during the Upper Jurassic according to [1]. These salt domes are composed of gypsum, salt, sandstone and limestone. Apparently, difference in these salt domes is caused with salt-bearing layers at salt domes which were created during Late Precambrian near the Ravar Fault.

There is a lack of xylonite fragments (chert-bearing dolomite, limestone, volcanic rocks and others) in salt domes of the Upper Jurassic age. Of course salts in these two formations are mixed in some areas to each other. Upper Jurassic saline layers are changed in facieses to southward in limestone and continental red layers in Bidu |Formation to northward side in the Esfandyar Reef limestone [2].

The Upper Jurassic formations with evaporites are simultaneous to evaporate formation from anhydrite Hith Formation in Persian Gulf and with Shurijeh gypsum-bearing layers in Kopet Dag and salt-bearing series to Central Asia and salts to north Afghanistan [3].

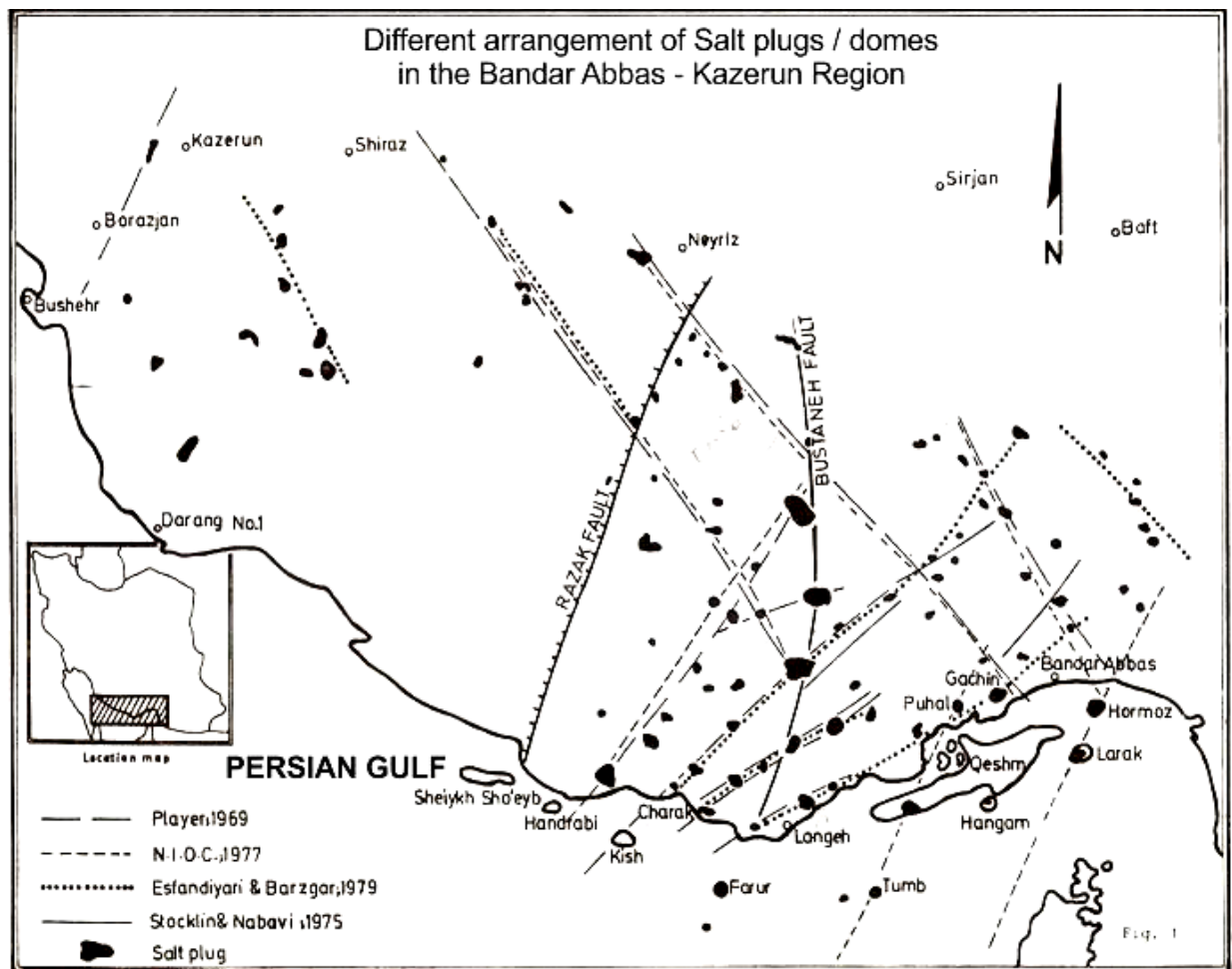


Fig 1. Scattering salt domes in southern Iran [2]

Eocene salts in Central Iran zone. Eocene salts are exposed in Yazd-Ardakan Basin. [4] knows the vicinity of Ardakan salt domes to present types of Kashan and Qom towns and they are attributed to deposits before Oligocene. Eocene salt beds are recognized from Kalout Basin basement to northeast of Iran. Several salt outcrops are usually between layers in lower parts with thick sequence from sandstones with gray to green colors, siltstone and tuff shales with middle Eocene nummulites. These beds are as salt domes in several areas and they have cut red Neogene sediments. Some of evaporate deposits from corner of Miocene and some of basal deposits of Upper Red Formations are created. They known as Shurab Mount. From first type (120 km from southwest of Qazvin town) and Semnan town and salt mount is from type II. It seems salt domes are attributed to North Kavir Zone, east Tehran and south Semnan which are pertaining to Miocene. They are in reality as two various saline formations and a formation is attributed to Eocene and other one is pertaining to Miocene which are generally in central parts of domes with Eocene salts (with near white color and volcanic inclusions) are similar. Some salt domes have outcrop of deposits in Tertiary period in salt-bearing basins from Ardakan and Yazd towns in various shapes. To northeast Ardakan which is named Kalout Basin and salt domes are related to Early Lutetian and likely Eocene [2].

Eo-Oligocene salts. Through central Iran, NW and NE Iran, after volcanism phase was relatively calm under Eocene, sea and extrusion activity of lava is decreased in the mentioned regions and with continuing in volcanism as extrusion of products as volcano-clastics and their sediments were formed to late Eocene (formation of Lower Red Formation) as lens and small and big lenses and they are thick and thin some of main reservoirs are gypsum and salt in Qom basin, Saveh town (Palang Abad ore deposit), Semnan, Garmsar, Neyshabour and Varamine are in this type [2] (fig. 2).

Tertiary salts in central Iran zone. Some of salt domes are situated around Garmsar and Ivanakey towns with Eo-Oligocene age. They can be characterized in Lower Red Formation, but some salt domes age and genesis were discussed and it is not completely characterized. For Tertiary salts, present in central Iran, there are two different origins, so that some of the Miocene evaporite deposits and others originated from basal deposits of Upper Red Formation. [4]. Many salt domes are in the area of northern desert completely and or a part of that has its root in Miocene evaporate layers and these evaporate layers can be compared to evaporates in Ghachsaran Formation [2].

Conclusions. The largest salt deposits of Iran belong to the Hormuz Series that consists of volcano-sedimentary rocks and belongs to Late Precambrian–Early Cambrian. Iran is rich in salt deposits, and they are found in various forms as salt domes, closed lakes, and open seas. Evaporite series from Precambrian to present have been identified in many parts of Iran, but there are two major salt horizons as described by [2]. One is a salt horizon within the rock units equivalent to the Hormuz Series, which mostly spread in south of Iran. The second one is within the Tertiary rocks found in the Lower Red, Qom, and Upper Red Formations in Central Iran, Azerbaijan, east of Iran, and Gachsaran Formation in Zagros.



Fig. 2 Satellite image of the salt dome caprocks in the south Semnan (53,32 E & 34,57 N) [2]

References

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