Sedimentary petrology of Cretaceous carbonate pb- zn Kohroyeh deposit, sw of shahreza

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Abstract

The Kohrouye Pb and Zn ore-deposits is located in 25km SW of Shahreza city, This area is a part of Sanandaj-Sirjan zone (SS) ,and is a part of Isfahan-Malayer metallogenic province .And contained the lower Cretaceous sedimentary rocks.Field studies show that mineralogy of this area is simple and Galena is dominated ore-deposit and limestone bearing ore-deposit is sparite calcite. This area is intensively tectonized . Presence of abundant faults is the main cause of fluid immigration which it`s clearly observed crashed zones followed and conformed by mineralization vines (area).Results of laboratory studies demonstrate 9 carbonate facies divided in three parts; including : 1.Outer ramp, 2.Mid ramp, 3.Inner ramp.Presence of carbonate mud is an evidence on quite deposition and absence of turbulence after sedimentation in this environment . Fossils and other allochemes in this deposits demonstrate shallow and tropical coastal environments.Based on these three parts mentioned above, we determined distribution of energy. Sequence of this sedimentary rocks created by alternation of mentioned facies due to Progradation and Retrogradation.

Key words : *Kohrouye, Isfahan-Malayer metallogenic province, lower Cretaceous, ramp*

Introduction

The Kohroyeh region is located in 25 km SW of Shahreza, and is important due to Pb and Zn mineral reservoir.The case study limit has east longitudinal 51°,47' ,5" to 51°, 49',10" and latitude 31°,45',35" to 31°,47',5" .It belongs to metallogenic state of Esfahan -Malayer.The carbonate stone units of metallogenic state of Esfahan-Malayer with lower Cretaceous has valuable metallic ore-deposits.

This state has a longitudinal more than 500 km and latitude of 30 km at the edge of central Iran and in the zone of Sanandaj-Sirjan.Pb and Zn ore-deposits of Kohrouye are old mines of this metallogenic state and of then its internal-catch rock is carbonate in wich minerals concentrate more in contact of Cretaceous limestones with fain sands and Jurassic shails.The deposit environment of the region based on the Flugle(2004) procedure has been recognized a carbonate ramp. Mineralization limits is with reverse faults, and sometimes sliding direction toward northwest- southeast, that is parallel with above structural zone.Field and microscopic studies show that the region is intensively tectonized and many faults with various procedures have been registered in this limits.

Regional geology

Pb and Zn mineralization of the region has been put into the lower Cretaceous limes.In general stratigraphy sequence of stone units in the area of Ghasrecham- Kohroyeh includes thick layer to massive gray limestone in the middle Jurassic, thick layer detrital limes in upper

Jurassic to lower Cretaceous wich is placed on a collection of shail and fine sand with upper Jurassic.The lower Cretaceous limes are host of Pb and Zn reservoir.Also the upper Cretaceous with determined stratification has Ammonite fault in Maastrichtian, and new faults which include conical sediments as well alluvium plains.

Petrology of the region is simple and mineral galena is dominant , and little sphalerite is seen as a substitution around galena in the form of microscopy.Calcite and quartz are mainly considered invalid.The major mining limestones in host of ore-deposit is sparite.

The purpose of study

In this research ,after achieving field studies, and selecting sutitable section, sampling was done systematically, then near 110 microscopic thin section from selected samples prepared and study by polarizan microscope.next it was named based on Folk, Dunham and Wright classification.In microscopic studies, for determining the percent of allochemes, it was used the method of measuring applying comparative charts, and also using Flugle method , it was determind the skeletal and non-skeletal parts, cement, mud and existing structure.After samples classification applying the way of Lasemi (1980) and Carrozi (1989),facies and micro facies were explored and were adopted to Flugle facies(2004).Using these facies , facies column and perpendicular diversification of facies were designed.The correctness of facies and their places of sequence was examined and removed by the method of Seli F.R.D (Walker 1983).the place of forming each facie in sedimentary pool using this pillar and considering the Walter low as well comparison with today and old environments was determined and sedimentary model of lower Cretaceous of this area was porposed. Also considering the host stone of region is carbonate ,it must be cleared calcite or dolomite and as the lighting features of calcite or dolomite are similar, their distinction in this case study was difficult by lighting, so the simple methods of chemical colouring were used for distincting calcite from dolomite.Additionally from selected samples, 35 sample were randomly selected and calcimetery tested wich respecting the result, the quantity of dolomite in the region was little,and 91 percent of the samples is calcite.

Facies description

Study on stones and applying Flugle method caused recognition of 9 carbonate facies in parts of outer ramp ,mid ramp and inner ramp.(open marine and sand shoal), and their particular specification were resulted which these facies have been explained fallowing:

A) Outter ramp facies

1)*Bioclasting mudstone facies (facies1):*

This facies is comparable with Flugle RMF1, and its major allochemes include Rudist,Mollusca parts and little Echinoderm as well Orbitolina.Allochems are floating in lime mud and in some section, it has been accupied between current allochems by microspar.Stones belong to this facies has a fabric mud supported, and in some section of the facies stilolitic fissure is seen wich has been filled by oxidation as well unsystematic sparite traces wich has cut micrite background and indicates active tectonic in the region.Fining grains and huge mud in the facies is the reason of peace fullness in environment while sedimentary action and lack of energy after doing sedimentary.Also lack or being of little bioturbation debris indicates the conditions of lacking oxygen during sedimentary.

2)*Pelloid and cortoid wackston/ packstone facies (facies2):*

This facies is comparable with Flugle RMF4 and the major allochems of the facies include pelloid, cortoid and somehow Intraclast components, and other allochems include Mollusca, Rudist, Orbitolin and Echinoderm.The space between grains has been filled with lime mud and in some parts has mud supported fabrics as well grain supported.Allochems in this facies has weak sorting and is seen in some parts of this oxidation section and in some parts of the section, micritic mudstone has been weakly sparite.Considering the current allochems, and being mud in the facies energy of environment is low to medium.

B)**The mid ramp facies**:

1)*Pelloid and cortoid grainstone facies (facies3):*

This facies is equivalence of RMF8 wich its main components are cortoid ,pelloid and mictitic Intraclast companent, Echinoderm, Rudist parts as well Mollusca.The space between grains is filled by sparite cement and has supported grain fabric.Being of cement and lack of matrix in this face represents more energy toward previous facies.

2)*Rudist boundstone(facies 4):*

The major allocheme of this facies Rudist which includes the whole section and the space between them has been filled with micrite.Rudist is among of reef creatures.Growing beside each other make peace the space between them and as the result , mud forming between them and two separate decks will be connected by mud and make a massive ,and give name of boundstone to the stone.

C) Inner ramp facies(open marin)

1) *foraminfer wakstone (facies5):*

This facies can be comparable with RMF 13.The major combination of this facies is high percent of Foraminfer and their main structure is wakstone.Their major allocheme constituents are Orbitolin, Echinoderm,Bivalve and Bryozoa.The space between allochem are filled by micrit and mud supported fabric has been given.The life environment of foraminfer bentic generally is small limited and stripped from the depth and also in waters with normal salt(35%).Orbitolins wich is from Foraminfers is seen in plateues ramps and reefs.They have important comparable biostratigraphy.

2) *Intraclastic wackstone/ packstone facies (facies6):*

This facies is equivalence of RMF14 wich its major allochems are intraclasts of micrite, Echinoderm,Rudist,Mollusca and relatively less Cortoid.The space between grains are filled with micrite, and has heterogeneous matrix, and in some parts micrite has been transformed to microspar.Being lithoclastic parts indicates replacement again in sedimentary environment.

3)*Bioclast floatstone(facies7):*

This facies is comparable with RMF13, and its major allochem is Bivalve,Echinoderms, Rudist debris, Intraclastic as well Orbitolin.Matrix is heterogeneous and the space between grains are filled with micrite.The fabric is mud supported and effects of micritic covering is seen around some grains.The size of grains are from 0.5mm to more than 2mm wich considering its position has been given name of floatstone.Sorting and roundness of the grain are weak.Being Rudist and Bryozoa with mud matrix indicates the faceis is placed in open marine environment.

C) 2- sand shoal

- *Bioclast and Pelloid roudstone facies(facies8):*

This facies is comparable with RMF 28, and its major allochem of the facies is Rudist,Bryozoa and Echinoderm.Allochems are distributed heterogeneously and the space between grains filled with sparite.Being of sparitic cement shows a region full of energy.

-Bioclastic Wackstone(facies9):

This facies is comparable with RMF17 and its major allochem of the facies is Rudist debris, Intraclast, Green algae, Orbitolina and Mollusca.The matrix is heterogenous , grains are floating in micrite,and it has mud supported fabric.Sorting and roundness of the grains are weak.Being Rudist and Bryozoa with mud matrix indicates that the facies is in the lagon environment and low energy.

Sedimentary environment model of case study of region

Examining the facies column of lower Cretaceous stone of the region considered and changings wich has been taken place in the length of column,depositing these sedimentaries in one ramp was recognized.For determinig the correctness and improving aforementioned model it was used F.R.D method, and using this procedure , unity among microfacies wich in perpendicular sequence put on each other, were evoluted (considering being positive or negative of the digits got), so applaying the determined facies sequence, improvement as well porposed sedimentary model was completed.

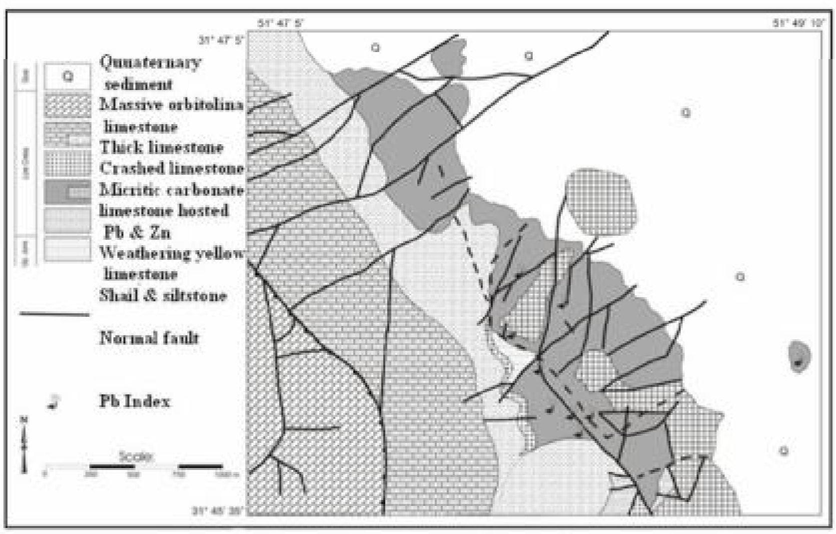

Fig1 : Geological map of Pb-Zn ore-deposit of Kohroyeh(Shahreza)

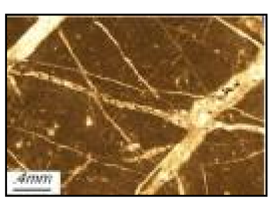

Fig2.Bio Mudstone

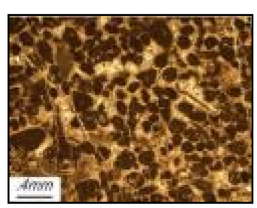

Fig3.Pel,Cor Grainstone

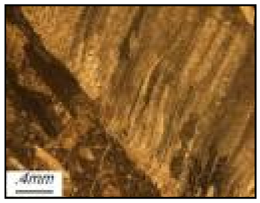

Fig4.Rudist boundstone

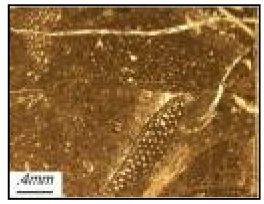

Fig5.Orbitolina wackstone

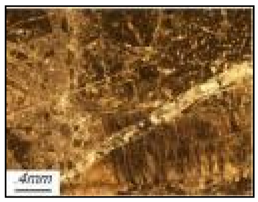

Fig6.Bioclast Floatstone

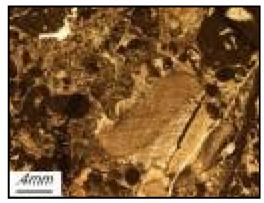

Fig7.Roudstone

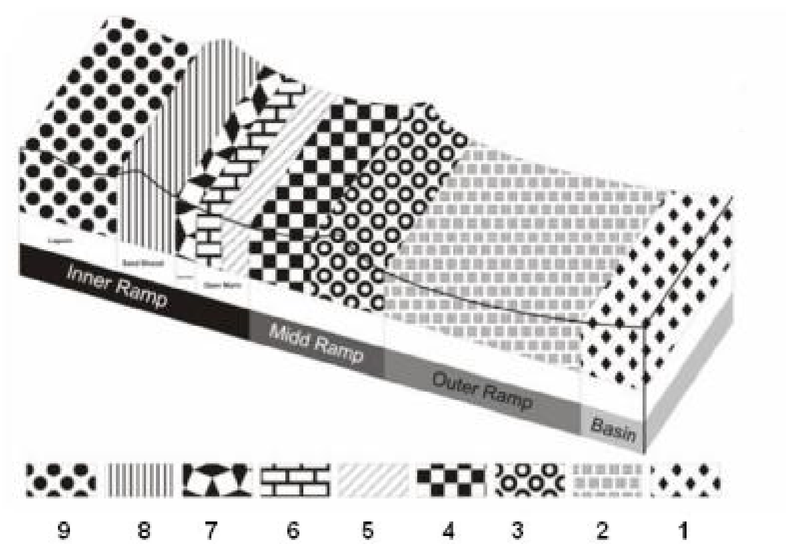

Fig8. Sedimentary environment model of case study

Legend:

1-Bioclast mudstone
2-Peloid,Cortoid wackstone/packstone
3-Peloid,Cortoid grainstone
4-Rudist boundstone
5-Orbitolina wackstone
6-Intraclast wackstone/packstone
7-Bioclast floatstone
8-Bioclast,Peloid roudstone
9-Bioclast wackston

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