Scholars Bulletin
(A Multidisciplinary Journal)
An Official Publication of "Scholars Middle East Publishers",
Dubai, United Arab Emirates
Website: http://scholarsbulletin.com/

ISSN 2412-9771 (Print)
ISSN 2412-897X (Online)

Ancient Plate Boundary Identification

Zhao Yin[1], Wang Defang[1], An Xiaodong[2], Liu Yachao[3]
[1]College of earth science of Northeast Petroleum University, Daqing, Hei Longjiang, China
[2]The shanshan production plant in Tuha Oilfield, Turpan, Xing Jiang, China
[3]The first production plant in Xibei Oilfield, Korla, Xing Jiang, China

***Corresponding Author:**
Zhao Yin
Email: 1229369974@qq.com

Abstract: Plate boundary is often sedimentary basin boundary. Different plate boundary takes different control actions on sedimentary basin. Therefore, the study on the identification plate boundary sedimentary basin is very important. Plate tectonics are three different mechanical properties of its boundary with the adjacent plate with zoning, so ancient and recovery partition plate is identified with the identification of ancient plate boundaries closely linked. However, it is precisely on this fundamental issue where there is a need to look at. Because the so-called boundary is not really determined by plate boundary that divided up the bulk of the plate but not truly Asian plate, the plate and the secondary block, rock. Therefore, in the study of ancient plate, the first problem is to identify the real plate boundary to suture, subduction zones, and expanding boundaries and transform boundary. When plate tectonics in the boundary school division of the plate is determined by a series of geographical, geological, seismic, geophysical and other signs; and for ancient plate boundary is determined, geomorphology, geophysics, seismology methods and logo on the petrology, structural geology, geography and ancient methods of ancient plate replaced by a sign which petrology has special significance.

Keywords: Propertyplate tectonics; Ancient plate; Border.

INTRODUCTION

Reconstruction of ancient continental crust on the plate is a very complex issue. Generally through the study of the existing sector activity indicator, find the corresponding material record keeping geological time down in the continental crust, namely recycling old plates with contour "will present the Ancient" method.

ANCIENT PLATE BOUNDARY IDENTIFICATION

Geosynclinal fold belt

Subtractive plate collision zone generally occurs between the edges of two continental land mass [1]. Between ancient terrestrial channels is often the butt two continental margins from each edge of the continent have different periods fold belt, and a symmetrical or partial symmetry appear, the latest period pleats hungry band is generally sutured position line or the docking zone.

Super lithosphere fracture

To suture or docking with ships Zou ultra deep lithospheric rupture dynamics from the point of view, should be extruded in the fault zone, so development thrusts, over thrust, nappe structure and the corresponding associated geological elephant .

Ophiolite

Representative of ancient oceanic crust fragments was banded on a deep fault zone, and rock into a more fault contact, with emplaced characteristics. Including complex combination of ultrabasic rocks, gabbro dykes, pillow lavas and cherts sequence, a set of rules, but due to the destruction of the structure, sequence often incomplete.

Melange

Mélange is the overriding plate subducting plate is scraped off deposits, mostly turbidites and ocean deposits, in addition also include ophiolite rocks ingredients. They parked in the plot line of contact, and the overriding plate and slide down the rock crushing stirring, extrusion, stacked together. Mélange of rocks of different sizes and shapes, from a few centimeters to several kilometers. Including different rock lithology and age of different alien finger blocks divided by the shear plane. He said deposition melange, rock composition and more ophiolite rock group propriety, called ophiolite when the ingredient is sedimentary rock mainly.

Pairs metamorphic belt

In Japan, high pressure low temperature metamorphic belt occurs near subduction zones, said outer band, high-temperature low-pressure metamorphic subduction zones farther away from, said inner band. Both of which are formed in the same period appear different

environments metamorphic belt, so called double metamorphic belt. Generally high pressure low temperature metamorphic belt of plate tectonics closer relationship, and the scope of the low-pressure high-temperature metamorphic belt appears more extensive, intrusive rocks in the contact zone often have high temperature metamorphism.

Continental margin volcanic activity

Modern plate subduction zone with the disc margin area and the island arc calc-alkaline volcanic rocks often appear, 150-200 km away from the leading edge of the volcano deep trench, seem to indicate Quan declined plates began to melt in there deep. The most common volcanic rock type is andesite, may have tholeiitic andesite before.

Paleontology flag

In the geological history of paleontology and biogeography Flora formation of ocean basins and is mainly due to the impact of the isthmus barrier, as well as control of ancient latitude and climate zones, both of which are likely to be associated with plate motion, should be specific analysis. Generally the most sensitive terrestrial animals and plants in terms of reaction continental drift, on two continents today found a certain period of geological history have had the same paleontological community, it is possible that they used to be a continent.

Paleoclimate flag

Paleoclimate served as important evidence of continental drift, especially where Gondwana Carboniferous - Permian glaciers remain united as they once an important basis [2]. On the other hand, on the same continent today, if two adjacent regions in the same period paleoclimate different back then, they may also be considered the continent two have been separated by oceans belong to different climatic zones.

Sedimentary assemblage Type

Wang Hong Chen (1980) on the deposition type a detailed division, he as sent from the reality of East Asian continental margin, the Chinese formations common in sedimentary type summarize grouped into six types and 24 combinations, including terrestrial stable type, terrestrial transition type, activity type terrestrial, marine stable type, marine type of transition and marine activity type. For a deposition area and the type of deposit portfolio analysis, and summarizes their distribution in space, it helps to understand the face area palaeostructure determine the boundaries of the joint edges of continents and different types of regional tectonic units.[3]

Paleomagnetic flag

By measuring the residual magnetism of rocks at different times in an area, it can be inferred palaeolatitude change in the relative position of the region during the geological history of the Earth's magnetic poles or on the ground in the area where the history of the period. The results are available on different continents every continent polar wander the surface of the track position and the current relationship between mainland compare. If all continents show the same polar wander, it shows that did not happen over each other relative movement between the mainland. If the pole shift curves deviate from each other, then there is drift between the mainland too. Two motion toward or away from the collision of continental blocks have different poles before wandering curves. After the collision split, poles wander curve two land masses on the proximity or coincidence [4].

COLLISION OROGENIC BELT AND ROCK SIGN OVERTHRUSTS COLLISION SYSTEM

Plate tectonics in collision tectonics summarized many of the collision and the collision of the continental block collision after docking petrology flag, in this regard include the well-known examples are the Alps and the Himalayas orogen orogenic belt collisional orogenic belt petrology, and in particular the impact of the collision of the school after the granite and volcanic rock school[5].

In recent years, Deng Wanming Tibetan Plateau and adjacent areas to further investigate the Cenozoic volcanic rocks, check minthi Kunlun erupted lavas sodium, potassium, compared with other parts of the lava; Cenozoic Basin, Gansu Province Lixian ultra lava magnesia-based; Yunnan Jinsha River, the mafic volcanic rocks and Southeast Yunnan Tengchong ingredient significantly increased, but also some of the common mantle xenoliths, indicating the local volcanic series from primitive mantle.

At the same time, Mo Xuan science and other areas of the Cenozoic volcanic GANDISE were studied, they are considered India a main Asian continent collision volcanism response: between the region and its volcanic Linzizong with the underlying strata regional unconformity structure provides new evidence of a volcanic continental collision; petrology, major elements, trace elements, rare earth elements and Nd-sr-Pb isotopic geochemistry studies suggest that early Linzizong volcanic rock has obvious continental margin arc volcanic features, signs began to appear mid-continental magmatic activity within the shoshonite late show more thickened continental crust under conditions of volcanic features; 40Ar / Ming Ar dating volcanic system determines Linzizong age interval 40.84 ~ 64.47 ma, the bottom of the age of 65Ma.

ANCIENT SUBDUCTION ZONE AND THE ANCIENT OCEAN BASIN, PETROLOGY FLAG

When plate tectonics in the boundary school division of the plate is determined by a series of geographical, geological, seismic, geophysical and other signs; and for the ancient plate boundary determination, geomorphology, geophysics, seismology and signs on

the way petrology, structural geology, geography and ancient methods paleomagnetism replaced, which petrology flag has special significance. Designed to determine the ancient plate boundary below Petrology logo for a special talk further discussion.

In the cross-sectional volcanic field observation, four Fort Complex has a pillow-like structure in addition to see the spilite, basalt, but still see a considerable number of volcanic rocks (tuff, volcanic breccia and volcanic rock) and turbidites they are consistent with the surrounding rock occurrence, and synchronized with folds. Most illustrates its geochemical data to prove the existence of high alumina basalts and calc-alkaline rocks, show the tectonic setting of the volcanic island arc formed in nature.

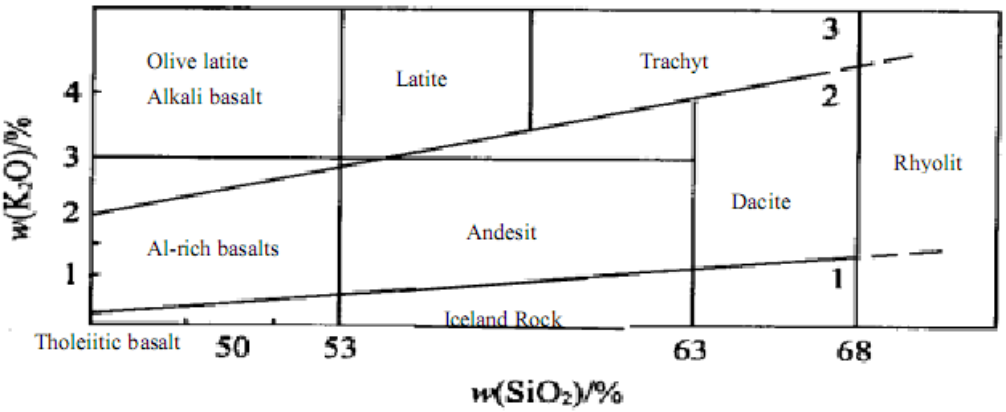

Fig-1: Diagram of ω (SiO_2)- ω(K_2O)
1-Tholeiitic basalt; 2-Calc-alkaline rock series; 3-Potassium rock series

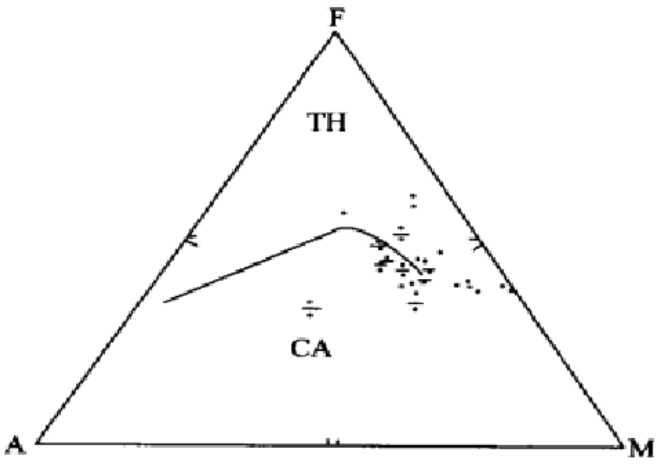

Fig-2:Diagram of FAM
TH-Tholeiitic basalt series; CA-Calc-alkaline basalt series;·-Four Fort Volcanic Group ; ÷-Group Volcanic fanjingshanensis

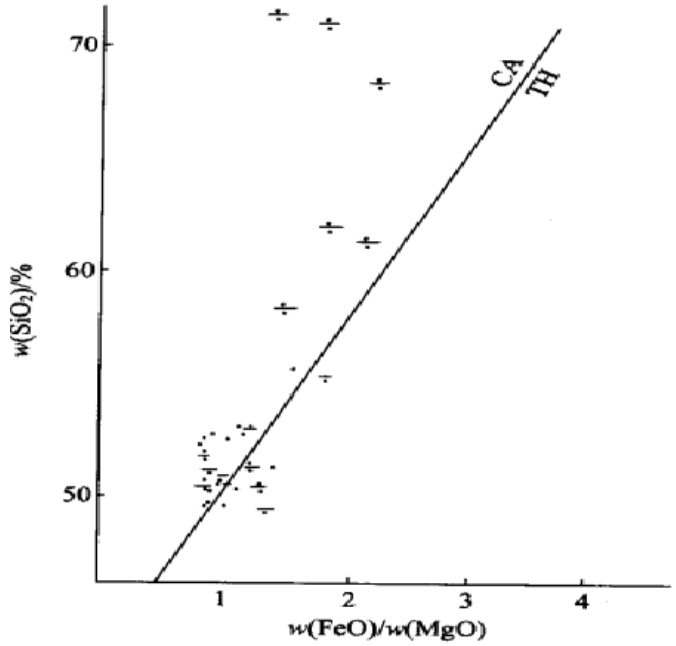

Fig-3: Diagram of ω (SiO_2)- ω(FeO)/ ω(MgO)
TH-Tholeiitic basalt series; CA-Calc-alkaline basalt series; ·-Four Fort Volcanic Group ; ÷-Group Volcanic fanjingshanensis

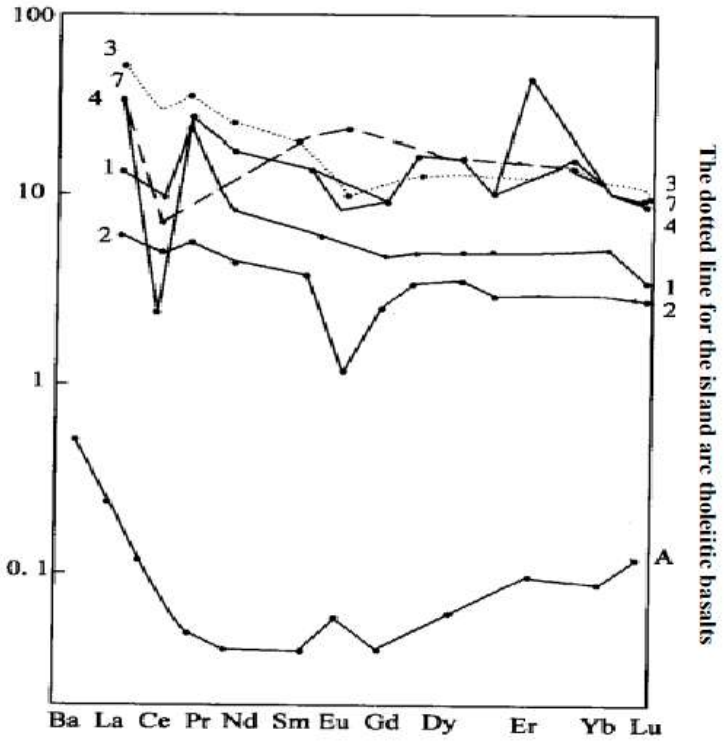

Fig-4: Diagram showing the distribution curve of REE
1-Fanjingshanensis group magnesium Fu Fai PERIDOTITE; 2- Fanjingshanensis Hui group of iron-rich olivine rock; 3- Fanjingshanensis group diabase; 4- Fanjingshanensis group spilite; 7- Four Fort Complex fine Bi Yan; A-ophiolite peridotite

It should also be mentioned that in the Fort four groups also development basaltic komatiite. According to Yang Lizhen research, Wen Tong segment group, divided into bottom-up heap grain belt, with spinifex and condensation zone, respectively, by fai stone komatiites, basaltic komatiites and tholeiitic lavas Rb-Sr isochron age is (1667±247) Ma), belongs to the chemical composition of ultramafic - mafic rocks, after

the formation of island arc environment area arc extensional continental marginal seas.

Whether Fanjingshan area or 90,000 mountain can see a set of Banxi (xiajiang group, Kelantan group) are not integrated a group of ultrabasic sills, dikes, Fort them four families Martinique subvolcanic rocks of the same period.

Ancient subduction zone as well as other signs of petrology melange and blue amphibole schist, but Dong Shen Bao [6] so after the blue schist belt of our research, that some deep fault may also be formed glaucophane schist, but not necessarily to in the oceanic crust subduction tectonic environments in order to form.

Melange although subduction zone is a peculiar rock type, but people will be vulnerable to gravity slump rocks and tectonic breccia mistaken melange. For example, developed in Silurian sedimentary gravity slump in southeastern Guangxi Cenxi a Bobai Chi fault zone, rather than melange. The former is essentially still a sedimentary rock, but deposited under the influence of faulting instability and collapse of the slide from the deposited layer in the wild can still be recognized sedimentary structures and stratification, sequence; but the latter is essentially a tectonite , when the relatively large size of a large tectonic blocks mutual movement generated by tectonic zone, this configuration is not a rock band rock band structure within the general board, but rock structure in oceanic subduction zone formed band, thus melange can often find pieces ophiolite, it is also known ophiolite [7]. Chen Haihong paper has reported the distribution of ophiolite in Banxi Xuefeng Shandong side of the melange. We found that he finds melange is actually a trend NNE to mafic, ultramafic dikes squeezed into a compressional tectonic lens discontinuous distribution. Chen mistook melange, but both sides Banxi remains orderly. This non difficult to identify, but in the subjective mode and then go to the field to verify the way of thinking dominated very prone to error.

CONCLUSION

Plate boundary is often sedimentary basin boundary. Different from the plate boundary of the sedimentary basins of different control action. Therefore, the study on the identification plate boundary sedimentary basins is very important. Plate tectonics is its three different mechanical properties of the boundary with the adjacent plates with zoning, so ancient plates division and recovery is determined and differential ancient plate boundary closely linked. Since the so-called border is not really determined by plate boundary that divided up the bulk of the plate but not really Asian plate, the plate and the secondary block, rock. Therefore, in the study of ancient plates, the first problem is to identify the true plate boundary - to suture, subduction zones, expansion and conversion border border.

REFERENCES

1. Jishun, R., & Ting-yu, C. (1990). Cattle and other valuable tectonic evolution of eastern China and adjacent areas of the continental lithosphere and Mineralization. *Beijing: Science Press*, 73-75.
2. You, Z., & Zhao, Z. (1997). Full stone congruent first determined CENXI Permian island arc basalts and the tectonic significance - important evidence of Guangdong and Guangxi at the junction of the Paleo-Tethys tectonic belt. *Chinese Science Bulletin*, *42* (4), 413-416.
3. H. C. Wang, Wang Ziqiang, Zhu Hong, Chen Yijun, Ruan Qiuqi. Chinese ancient Proterozoic tectonic and paleogeographic. Journal of Geology, 1980 (2).
4. Wenpu, M. (1996). East South China land Hei Gut Tis traces of Permian orogeny and interchange tectonic domain extension. *Geological science*, *37*(2), 105-111.
5. Jianhua, Q., Lin, W. Y., & Yang, Y. (1996). Indosinian sedimentary and tectonic evolution. *Journal of Geology*, *70* (2), 99-107.
6. Lin, H., Jiguang, L. (1993). Southwestern Fujian foreland fold and thrust belt preliminary study. Beijing: *Metallurgical Industry Press*, 27-33.
7. Chunyu, L. (1986). Basic problems of plate tectonics. *Beijing: Seismological Press.*
8. Jiliang. (1993). Editor southeast continental lithosphere structure and geological evolution. Beijing: *Metallurgical Industry Press*, 27-33.