A Big Earth Data Platform for Three Poles

**Provenance and tectonic setting analysis of the Upper Triassic Zangxiahe Formation sandstone in the Northern Qiangtang Basin**

1、Description

Objectives: The Qiangtang Basin is the largest Mesozoic marine basin in the Xizang( Tibetan) Plateau. There have been a lot of debate about the nature and evolution of the Late Triassic Qiangtang Basin. The Zangxiahe Formation that deposited on the northern of the Qiangtang Basin and consist of sandstone and mudstone sediments,which is an significant record for the Late Triassic property of the Qiangtang Basin. The aims of this study are to constrain the nature and tectonic evolution of the Late Triassic Qiangtang Basin based on their provenance and tectonic setting of the Zangxiahe Formation sandstones.Methods: The X-ray fluorescence( XRF) and high-resolution inductively coupled plasma mass( HR-ICP-MS)are used to make the major and trace elements analysis of the Upper Triassic Zangxiahe Formation sandstones in Ganggairi area,the northern Qiangtang Basin. The major and trace elements analysis of samples were measured in the Analytical Laboratory,Beijing Research Institute of Uranium Geology,China.Results: For the Zangxiahe Formation sandstones,Si O2( 66. 9% ～ 76. 2%) and Al2O3( 10. 6% ～ 13. 2%) are the most abundant oxides. The second most abundant oxides are Fe2O3( 2. 70% ～ 4. 87%),Mg O( 0. 81% ～2. 25%),Ca O( 0. 42% ～ 3. 66%),Na2O( 1. 69% ～ 2. 36%) and K2O( 1. 63% ～ 2. 21%),while other oxides including Mn O,Ti O2 and P2O5 contents are lower than 1. 0%. Elements Si and P show slightly enrichment and other oxides show apparent depletion compared to UCC. In comparison with UCC,large-ion lithophile elements,include Sr,Cs and Ba,are depleted significantly. High field strength elements Zr and Hf have similar geochemical properties and enriched significantly. Transition trace elements,Sc,V,Cr,Co,Ni and Zn,also show apparent depletion. The total rare earth element( ∑REE) contents of the Zangxiahe Formation sandstones are 170. 3×10-6～253. 2×10-6( avg. 199. 4×10-6),which are higher than that of the UCC and have significant negative Eu anomaly.Conclusion: The CIA( 55. 0 ～ 65. 9,average 59. 1),CIW( 60. 6 ～ 74. 3,average 65. 9) and PIA( 56. 1 ～70. 6,average 61. 5) values indicate that the intensities of weathering in the source area were weak. No obvious Kmetasomatism occurred in these sandstones based on the A—CN—K diagram and low K2O contents. The relatively high ICV values reflect the source was first-cycle sediments of the active tectonic zone possibly. The Al2O3/Ti O2( 15. 4～21. 6,avg. 18. 5) values of the Zangxiahe Formation are similar to the intermediate igneous rocks,while Ti O2/Zr( 11. 9 ～ 33. 5,avg. 20. 3) values are similar to felsic igneous rocks. The Cr/Th—Sc/Th and Co/Th—La/Sc bivariate diagrams and significant negative Eu anomaly reveal that the Zangxiahe Formation sandstones were potentially derived from felsic igneous rocks,and mixed with minor intermediate igneous rocks. The( Fe2O3 T+Mg O) —Al2O3/Si O2,( Fe2O3 T+ Mg O) —Ti O2,( Fe2O3 T+ Mg O) —Al2O3/( Ca O + Na2O),Si O2—K2O/Na2O and La/Sc—Ti/Zr bivariate diagrams and La—Th—Sc,Th—Co—Zr/10,Th—Sc—Zr/10 triangular diagrams indicate that the source areas of the Zangxiahe Formation sandstones were sourced from the active continental margin and continental island arc,while also mixed with minor passive continental margin,which may be formed in the backarc foreland basin.

2、Keywords

Theme：neotectonics,Geochemistry,Tectonics,Element geochemistry  
Discipline：Solid earth  
Places：Qiangtang Basin  
Time：Late Triassic

3、Data details

1.Scale：None

2.Projection：

3.Filesize：0.5MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：35.0 | - |
| west：89.3 | - | east：89.7 |
| - | south：34.6 | - |

5、Time frame:None--None

6、Reference method

References to data:

WANG Zhongwei. Provenance and tectonic setting analysis of the Upper Triassic Zangxiahe Formation sandstone in the Northern Qiangtang Basin. A Big Earth Data Platform for Three Poles, doi:10.11888/Geo.tpdc.2713852021

References to articles:

王忠伟, 占王忠, 高远, 余飞, 肖杨.（2016). 羌塘盆地北缘上三叠统藏夏河组沉积物源及构造背景分析. 地质论评, 66(05), 1199-1216.

7、Supporting project information

Second Tibetan Plateau Scientific Expedition Program

8、Data resource provider

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