

Paper Number: 755

Uplift-denudation of peripheral orogenic belts control on the formation of sandstone type uranium (U) deposits in Junggar Basin, Northwest China: Implication from apatite fission track research

Song, J.Y.¹, Qin, M.K.¹ and Cai, Y.Q.¹

¹ Beijing Research Institute of Uranium Geology, No.10, Xiaoguangdongli, Chaoyang district, Beijing 100029, China, jessica_0@163.com

Junggar Basin, located in the western Central Asian Orogenic Belt (Figure 1), is famous by oil-bearing and sandstone type U deposits in China.

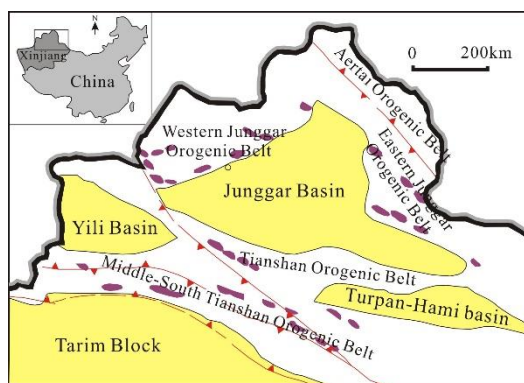


Figure 1: The tectonic framework of Junggar Basin

The coupling development and evolution of Junggar Basin and its peripheral orogenic belts play an essential role in controlling the distribution and transformation of sedimentary facies which control the U mineralization, preservation and renovation (Han X.Z. et al.) [1], and dive us to concern the genetic relationship between the uplift-denudation of peripheral orogenic belt and sandstone type U mineralization in Junggar Basin through apatite fission track research.

The apatite fission track research indicates there are six regional tectonism occurred in Junggar Basin since Permian, and each tectonism influenced the original basin morphologies and metallogenic environment of sandstone type U deposits differently. The tectonism not only made the U-rich basement being uplifted which resulted erosion and migration of U source into the basin, but also led to the formation of the front slope belt which is conducive to a later water supply and drainage system. The genetic relationship between uplift-denudation of peripheral orogenic belt and sandstone type U

mineralization in Junggar Basin is showing in Table 1 in detail.

Table 1: This table is showing the genetic relationship between tectonic uplift of peripheral orogenic belt

Time	Tectonic event	Tectonic uplift				sandstone type U mineralization
		Western	Eastern	Northern	Southern	
N-	Himalayan Tectonism				speedily uplift of the south Junggar basin	the destory of previous U mineralization in southern Junggar basin
E ₁				Uplift of the northern Junggar basin		the formation of the Dingshan U spot in northern Junggar basin
K ₂	subduction of Turpan-Hami block into eastern part of Junggar block		Uplift of the northeastern Junggar basin			The formation of Daqinggou U deposit in eastern Junggar basin.
J ₃ -K ₁	India - Eurasia plate collision	Differential uplift of peripheral orogenic belts				frequent U mineralization around the Junggar basin.
T ₃ -J ₁	Closure of Tianshan Paleo ocean, and subduction of Tarim into Junggar block.		Uplift of the northeastern Junggar basin			The Upper Triassic that contains reducing materials overlapped on the northeastern basement of Junggar basin.
P ₃	Continental collision between the Kazakhstan plate and Junggar block	Uplift of Zhayier and Halaalate mountain				The formation of the earliest U spot in western Junggar basin

and sandstone type U mineralization since Permian, Junggar basin

References:

[1] Han X.Z. et al. (2008) *Acta Petrologica Sinica* 24(10): 2447-2455

