



Sedimentary conditions of Upper Permian volcano-clastic rocks of Ayan-Yrahskiy anticlinorium (Verhoyansk-Kolyma orogen)

Anna Astakhova and Aleksandr Khardikov

South Federal University, Rostov-on-Don, Russian Federation (astakhova.a.anna@mail.ru)

Sedimentation conditions of upper Permian volcano-clastic rocks of Ayan-Yurakhsky anticlinorium are the reason of discussions between researchers. It is important to correctly solve this problem. Investigation allows us to conclude that upper Permian sediments was formed due to high rate deltaic sedimentation on shelf and continental slope of epicontinental sea basin.

More than 45 outcrops of upper Permian sediments were described within Ayan-Yurakhsky anticlinorium. Termochemical and X-ray phase, lithological facies, stadial, paleogeographic and others were applied. Investigation allows to classify following types: tuffs, tuffites of andesites, andesi-dacites, sandstone tuffs, siltstone tuffs and claystone tuffs. Two facies were delineated in the research area: 1) delta channel facies 2) epicontinental sea shelf edge and continental slope.

Delta channel facies are located on the south-west part of Ayan-Yrahskiy anticlinorium. It is composed of silty packsand and psammitic tuff-siltstone alternation and gravel-psammitic andesi-dacitic tuffite and tuff-breccia bands. Sediments have cross-bedding, through cross-bedding, curvilinear lamination structures. Facies occurred during high rate deltaic sedimentation on the shelf of epicontinental sea.

Epicontinental sea shelf edge and continental slope facies are located on the south-west part. Sediments are represented by large thickness tuff-siltstone with tuff-sandstone, tuff-madstone, tuff, tuffite bands and lenses. Large number of submarine landslides sediments provide evidence that there was high angle sea floore environment.

30-50 m diametr eruption centers were described by authors during geological traverses. They are located in Kulu river basin. Their locations are limited by deep-seated pre-ore fault which extended along Ayan-Yurakhsky anticlinorium. U-Pb SHRIMP method showed that the average age of circons, taken from eruption centers, is Permian ($256,3 \pm 3,7$ ma). This fact confirms our emphasis that eruption centers were the centre of underwater effusive explosions which had been occurred in late Permian time.

Gold ore deposits mainly localized in the south of Ayan-Yurakhsky anticlinorium and associated with upper Permian deltaic facies sediments. Taking into account lithological facies feature and volcanoclastic origin of sediments it is reasonable to suggest expelled-catagenesis model of gold mineralization. Gold was entered in sedimentary basin with piroclastic material. During cataogenesis stage gold migrated from complex of shelf edge and continental slope to fan delta front complex in conjunction with expelled water. The emplacement of ore gold deposits related with upper Permian sediments can be successfully predicted, using this model and associated techniques.