

NATURAL REGENERATION PERIODICITY OF GOLD PLACERS IN PERMAFROST ZONE: A NEW KNOWLEDGE

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The very common regeneration of gold placers in permafrost zone of the northern Hemisphere has long been considered to be associated with the superficial geochemical behavior of gold in cold environment and are suggested to take place periodically with a time span of 15-20 years (Tu 1992). However, recent model experiment implies that gold complex ions (Au^{1+}) or particles (Au^0) in cold water are unstable and not able to migrate a long distance. They almost precipitate quickly in situ (Zhang et al. 1997). The content of gold (Au^{3+} , Au^0) in water is very low ($n \times 10^{-9}$ - 10^{-12}) and insufficient to supply the necessary source for the regeneration. Where is the source? We note that the recovery rate of gold placers in cold water are only 30-50%, even 20-30% lower than in warm water. Therefore, there is a great amount of relict fine gold grains in mined-out sediments. Most of them are absorbed by sticky muds and ice. The conversion of a deserted gold placer to a regenerated deposit is suggested mainly to be the result of freeze-thaw sorting re-concentration process of the large amount of fine gold grains and their secondary enlargement by absorption of surficial gold from solutions. Further experiments and calculations should be done. Besides, the geochemical behavior of gold in permafrost zone should be studied comprehensively.