

## Mechanism of metal mobilization and accumulation in metamorphic reactions

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Evidences of the metals are mobilized and concentrated in ore deposits in the course of metamorphism imply, that cations existing in the matter in invisible state, transit during metamorphic reactions into the visible mineralized form.

Mechanism of this process can be considered in terms of mineral matter transformations via the aquacomplex of  $[2\text{SiO}_3 - \text{OH}_2 - 2\text{M}^{n+}\text{M}^{m+}\text{O}^{4-}]$  ( $n=1,2$ ;  $m\geq 3$ ;  $\text{O}^{4-}$ -O, F, Cl, S) general type. It was shown that this species, representing an universal crystallochemical unit of mineral matter, mediates its structural-chemical rearrangement. In so doing, the aquacomplex converts energy disbalance, caused by rock deformation or lithostatic pressure, into the internal energy of newly formed minerals. This is provided by the wide energy capacity of the aquacomplex due to the various energy bonding of the ions substituting Si and  $\text{M}^{n+}$ ,  $\text{M}^{m+}$  positions in the oxygen polyhedra. This energy ranges from tens of kkal/mol (63-CuO; 87-FeO; 89-PbO) up to the hundreds kkal/mol (190-SiO; 256-CO; 180-UO; 190-ThO). Due to this the elements with the  $E_{\text{M-O}}$  energy conforming to the external energy disbalance are extracted from the wall rocks, incorporated into the aquacomplex-intermediate and migrate through the rock matter during its structure-chemical transformations.

Ore mineralization occurs as the mineral continuum having a structure of the aquacomplex falls on the conditions of its disintegration. The major factors for this are inversion of Ox/Red potential in the mineral system and the presence of Ca (Sr, Ba) - containing rocks, as these elements can not be incorporated in the aquacomplexes. As the aquacomplexes are disintegrated, crystallization of their left part ( $\text{SiO}_2$ , quartz), right part (metal oxides and sulfides) occurs. Simultaneously water is liberated, manifesting hydrothermal activity and metasomatism.