

DRIVING FORCES OF ORE-FORMING PROCESSES OF THE SKARN Cu ORE DEPOSITS OF TONGLING

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The dynamical theory of coupled processes of heat and mass transport and fluid-rock interaction in porous media was applied in studying the mechanisms of ore formation. The mechanisms of the ore deposits were simulated and made clear by employing the physical model of moving boundary for reactive flow under the assumption of local equilibrium in the ore-forming system, and the prerequisite of quasi-stationary approximation for reactive flow processes in permeable media. The established dynamical model incorporates the coupling of fluid flow under the non-isothermal conditions and the chemical reactions among multi-phases and multicomponents. It realizes advancement in the investigation of the dynamics of coupled processes of transport-chemical reactions.

The researches were conducted using combined methods of theoretical analysis and computer simulations. The entire courses of ore-forming processes in the two ore deposits of Tianmashan and Tongguanshan in Tongling district were studied. It includes the exposition of sequential events which happened after the intrusion of the intermediately acid magma into the wallrocks: the formation of temperature field and velocity field of fluid flow, the activation and mixing of rock-forming and ore-forming materials during the flow of thermally-induced fluid, the chemical reactions taking place, the fluid transport along the pathline, and finally the enrichment and precipitation of ore materials at the appropriate time and location.