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Physicochemical model for the genesis of Cu-Ag-Au-Hg solid solutions and intermetallics in the rodingites of the Zolotaya Gora gold deposit (Urals, Russia)

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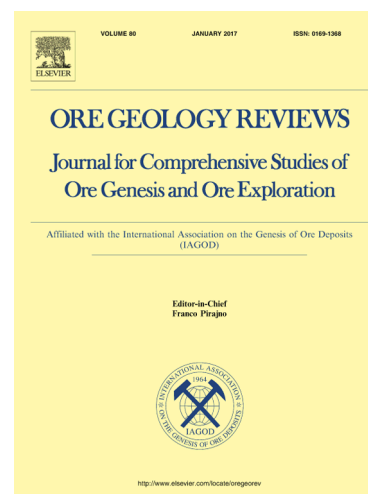
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1 **Physicochemical model for the genesis of Cu-Ag-Au-Hg solid**
2 **solutions and intermetallics in the rodingites of the Zolotaya Gora**
3 **gold deposit (Urals, Russia)**

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16 **Abstract**

17 In this contribution we examine the compositions of solid solutions and intermetallics of
18 the system Cu-Ag-Au-Hg and the physicochemical conditions of their formation in rodingites
19 from the Zolotaya Gora gold deposit (Southern Urals, Russia). Thermodynamic calculations,
20 modeling the formation of mineral assemblages of rodingite and Cu-Ag-Au-Hg mineralization,
21 were carried out using a “Selektor-C” software package. Two probable models for the genesis of
22 Au-Ag-Cu-Hg solid solutions and Au-Cu intermetallics in rodingites are: 1) hydrothermal; the
23 result of single-stage discharge in open space of deep-sourced gold-bearing fluid with the
24 composition corresponding to rodingite, taking into account its interaction with host
25 serpentinites. 2) metasomatic; deep-seated gold-bearing fluid (W) rising to the surface interacts
26 with early formed rodingite (R) at different ratios (W/R). T and P-conditions of modeling:
27 450°C, 3 kbar; 350°C, 2 kbar; 250°C, 1 kbar. Results of the calculations on the “hydrothermal”
28 and “metasomatic” models showed different degrees of similarity of natural and theoretical
29 model associations of rodingites. The *metasomatic model* is better for corresponding to real
30 mineral compositions and mineral paragenesis in the natural Cu-Ag-Au-Hg system observed at

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