

Factors of copper mineralization in the Gaoua deposit (southwestern Burkina Faso)

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The copper deposit of Gaoua is located in the southern branch of the Boromo-Goren greenstone belt. Data from petrographic, geochemical, structural and fluid inclusions studies allow to draw the following main conclusions:

(1) The main lithologies in the study area are intermediate magmatic rocks (andesites, diorites and microdiorites). Locally, more evolved terms (rhyolites and microgranites) are observed. The end of the magmatic history in the area is marked by andesitic breccia which displays clasts of the other lithologies.

(2) Geochemical data suggest an emplacement in a volcanic arc context.

(3) Structural records showed that the northern part of the study area have been affected by all the phases of deformations whereas the two thirds southern part is only affected by the second phase of deformation which is brittle-ductile to brittle.

(4) The copper mineralization seems to be related to the emplacement of the microdiorite and diorite plutons which followed the effusion of andesitic lava. hydrothermal circulation took place at the end of this calc-alkaline magmatism. The hydrothermal circulation occurred when all magmatic materials became more brittle. In the portions where brittle deformation created dilational structures the fluids enrich-copper crystallized in these structures whereas, when these structures do not exist, we observe hydrothermal breccia with several mineralized veins.

(5) Fluids inclusions studies revealed four types. The investigations on several samples showed that the four types of fluids inclusions can be found in the three types of mineralization at the same time.

Summarizing all this, we can say that the history of the mineralization begin with emplacement of microdiorite and diorite plutons and take end by hydrothermal circulation assisted by brittle tectonic or not. All these events took place in a relatively short interval of time and this can explain why the fluid inclusions natures do not change from one type of mineralization to another.

Keywords: Burkina Faso, greenstone belt, intermediate magmatic rocks, volcanic arc, deformation, copper, fluid inclusions