Chemical composition of fahlore-group minerals from the central and eastern Rhodope, southern Bulgaria and northern Greece

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Fahlore-group minerals, within magmatic-hydrothermal deposits/prospects of the Rhodope area, provide physicochemical constraints on precious metal ore formation, and may help to understand trace element distribution within the deposit. They cover the whole range of the tetrahedrite-tennantite solid solution independently from the fluid sulfidation state. The occurrence of goldfieldite indicates high-sulfidation fluid conditions and a close association to native gold.

Goldfieldite at Mavrokoryfi is remarkably Te-rich (up to 3.766 *apfu*) - the closest natural occurrence to the theoretical synthetic endmember $Cu_{10}Te_4S_{13}$. Argentian goldfieldite contains up to 4.469 *apfu* Ag. Another special feature is the occurrence of "Cu-excess" tetrahedrite (Cu=11.039 *apfu*, St. Demetrios) and tennantite (Cu=11.729 *apfu*, Pefka), accompanied by high-sulfidation minerals like enargite/luzonite, watanabeite, and colusite. In contrast, Fe- and Zn-rich varieties are known from intermediate-sulfidation state ore assemblages.

Decreasing Cu-content in tetrahedrite-tennatite solid solution series reflects an evolution from initial high-T, high-sulfidation, oxidizing conditions, towards lower-T and lower-sulfidation, more reduced conditions with time.