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Geochemistry and Genesis of the Manganese Deposits in Mankwadzi Southern Kibi-Wenniba Belt, Ghana

Kwabina Ibrahim, Frank K. Nyame, Johnson Manu
University of Ghana, Accra, Ghana

ABSTRACT

Major and trace elements distribution in samples from the manganese occurrence in the Mankwadzi area on the southern Kibi-Winneba belt of Ghana were investigated and the results obtained were statistically analyzed. The results show that the samples are enriched in Cu, Pb, Zn, and Ba and depleted in Co, Ni, Be, Mo, Sr, and Sn. MnO correlates negatively with Fe_2O_3 and the components K_2O , Al_2O_3 , MgO, Cu, Co, Zn, Sr, and Sn correlated positively with Mn. SiO_2 , Be, and Mo show a positive correlation with Fe and correlated negatively with Mn. Factor analysis extracted a five-factor model, that could explain ca 80% of the total variance in the data. F1 is interpreted as a separation factor between the Fe and Mn mineral. F2 and F3 reflect the association of some trace elements (Cu, Co, Zn, Ni, Pb, Sn, and Sr) with Mn minerals. F4 is a dolomite factor (CaO MgO) referring to the unreplaced remnants of the original country rocks. F5 reflects the dispersion of Ba in both ore minerals and country rocks. A comparison of the chemical composition of rocks with that of ferromanganese deposits occurring in various present-day environments suggests that hydrothermal activity is mainly responsible for their formation.