Rare Earth Elements mineralization in the Deri Ambaji area of South Delhi Fold Belt, India

DEVSAMRIDHI ARORA[1], MAYURI PANDEY[2], SIRAJUDDIN ANSARI[2], N. C. PANT[1] AND RASHMI GUPTA[2]

[1] Department of Geology, University of Delhi, New Delhi, 110007, India. devsamridhiarora@gmail.com

[2] Department of Geology, Institute of Science, Banaras Hindu University, Varanasi 221005, India. mayuri.geo@bhu.ac.in

The Deri-Ambaji mineralized zone of South Delhi Fold Belt (SDFB) hosts a number of VMS (Volcanogenic massive sulphides)-type deposits of two separate ages reported from Pb-Pb dating 1100 and 990 Ma. The reported host rocks are mainly carbonate facies rock, mafic, ultramafic volcanic and mafic plutonic rocks. The whole rock suite has been regionally metamorphosed up to amphibolite facies. An examination of lithologies from Ambaji mine through SEM-EDS and EPMA was carried out at Department of Geology, Banaras Hindu University, Varanasi, India confirmed the presence of quartz biotite schist, actinolite schist, hornblende schist, pyroxene hornfels and metapelite. The mineral chemical data of various lithologies have shown divergence from the previously inferred rock types and metamorphic conditions. The composition of biotite of quartz biotite schist (XMg ~84%-86%) is comparable to that of biotite from actinolite and hornblende schist (XMg ~83%-85%) and biotite of quartz amphibole schist (XMg ~81%-84%). However the amphibole of actinolite schist shows strong variablity (Mg/Mg+Fe ~0.78-0.88%) when compared to that of quartz amphibole schist (Mg/Mg+Fe ~0.80-0.82%) thereby indicating a mafic/ultramafic protolith. The metapelite comprises Rare Earth Elements (REE) enriched silicates, while hydrothermally altered hornblende schist hosts various shear zone controlled localised remobilized REEs enrichments. Remobilization of sulphides and LREEs could also have resulted from multiple post-Delhi magmatic activities. This work reports the potential REE enrichment in metallic minerlized rocks exposed in NW Indian shield for the first time.