Abstract

Analysis and integration of geological/metallogenic data and digitally processed gravimetric/aeromagnetic data to the oriental Saharan Atlas domain were carried out to understand the spatial distribution and structural control on Pb-Zn (Ba) deposits of the oriental Saharan Atlas. The use of this combined technique suggests that most of mineral deposits appear to be regionally controlled by structural trends (subparallel NE-SW-trending) along margins of subsiding sedimentary basins. Mineralization occurs along or near major NE-SW-trending faults, locally intersected by NW-SE-trending faults. In addition, mineral deposits are usually either inside anticlinal hinge zones (example, Merouana, Ichmoul and Ain Mimoum ore deposits) or on the flanks of anticlinal structures (example, Ain Bougda ore deposit). In "diapiric zone", mineral deposits are generally located on diapiric structures borders (peridiapiric concentrations), related to NE-SW/NE-SW and E-W-trending faults. Other mineral concentrations occurs along the margins of tectonic troughs zones (example, Morsott trough) resulting probably by NW-SE-trending deep faults movement. In summary, our research suggested that regional parameters, such as NE-SW/NW-SEtrending lineaments, intersections of these lineament zones and margins of subsiding sedimentary basins/diapiric structures, serve as significant indicators and provides a valuable framework for guiding the early stages of Pb-Zn (Ba) mineral exploration; other considerations must then be applied in this region, like integration of surficial geochemical anomalies that allows better delineation of targets for further mineral exploration.