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Contribution to the study of carbonatite complex of the Richat Dome (Mauritania)

Eboubekrine Sedigh Maham[1], Houssa Ouali[1], Michel jébrak[2], and Muhammed Ouabid[3,4]
[1]faculty of moulay ismail, faculty of sciences , geology , Morocco (houali@yahoo.fr)
[2]Department of Earth and Atmospheric Sciences, Université du Québec à Montréal, Canada (Jebrak.michel@uqam.ca)
[3]Geology & Sustainable Mining, Mohammed VI Polyechnique University, Benguerir, Morocco (muhaouabid@gmail.com)
[4]Instituto Andaluz de Ciencias de la Tierra (IACT), CSIC–UGR, Granada, Spain (muhaouabid@gmail.com)

The Richat Dome is a huge circular, slightly elliptical depression (~ 40 km in diameter) in the Proterozoic to Cambro-Ordovician sedimentary series of the NE part of the Mauritanian Taoudeni basin. This structure consists of a central zone that corresponds to a complex of dolomitic limestones and sedimentary rocks of Neoproterozoic age, cut by breccia silica and felsic volcanic rocks. A peripheral zone comprising Neoproterozoic to Late Ordovician sandstones and pelites into which carbonatite veins and two gabbroic annular dykes are injected.

Generally, the carbonatites represent a relatively rare type of igneous rock composed mainly of primary carbonate minerals (calcite and/or dolomite > 50 vol % of the rock) associated with phosphate minerals, silicates, and oxides. They contain the highest concentrations of rare earth elements (REE) of all igneous rocks. The carbonatites are also the main source of REE especially the light REE (La, Ce, Pr and Nd) as well as some critical metals such as Nb and Ta.

The aim of this study is to present a preliminary work on the carbonatite dykes of the Richat Dome: (1) detailed geological mapping of the various dykes, (2) petrographic, (3) mineralogical and (4) geochemical characterizations. The results obtained will be cross-referenced with other strategic deposits around the world