

DISTRIBUTION OF DIAMONDS AND KIMBERLITES ON THE REGUIBAT CRATON, MAURITANIA

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Diamonds and G10 pyrope garnets are common in the desert sands overlying the Archean parts of the Reguibat craton of northern Mauritania. Recent radiometric dating in collaboration with Jean-Paul Liégeois of the Tervuren Museum has more precisely defined the northern and eastern limits of the Archean terranes. The Archean is restricted to the south-western part of the Reguibat craton. The eastern limit of the Archean is defined by a large fan-shaped mylonitic zone to the east of the Tenoumer impact crater. The shear zone is 10 to 40 km wide and runs at a direction turning from north to south from NNW-SSE to N-S. To the north of Zouerat the limit between the Archean and the Eburnean (Lower Proterozoic) is defined by a strong east-west lineament just south of the Sfariat mobile belt.

Two kimberlite provinces, linked along a major SW-NE lineament, have been found just to the south and to the east of the Archean outcrops. The SW-NE lineament is closely related to the Guelb El Richat doming. The westerly province is located on or near the Guelb El Richat dome itself. The easterly kimberlite province occurs near Bir Amrane and contains at least 21 kimberlite bodies, seven of which are diamond bearing. The kimberlites are Jurassic in age, while the surrounding rocks are Paleozoic sediments of the Taoudeni Basin. Radiometric dating using the U-Pb method on apatites in a kimberlite gave an age of 154 million years, at the transition between the Middle and Upper Jurassic. The dating on the kimberlite was done by Claude Delor of the BRGM in France. The Taoudeni Basin covers a large part of the Reguibat craton (Archean and Proterozoic basement) and was initiated in late Proterozoic times. It contains Proterozoic, Paleozoic and Mesozoic sediments. None of the kimberlites bodies found to-date have economic diamond grades. The kimberlites are deeply eroded, carbonitized and of the hypabyssal facies. The kimberlites have a coarse porphyritic texture with abundant olivines and some phlogopites as phenocrysts. The kimberlites have a high concentration of complete pseudomorphs of secondary minerals after pyrope and contain some apatite macrocrystals. The rock contains ultramafic suite minerals of Ti-association (picroilmenite and orange pyrope) and Cr-association (violet pyrope). Picro-ilmenites are the most abundant indicator minerals, followed by G9 garnets and chrome-diopside. G10 garnets are however very rare in the kimberlites. According to Felix Kaminsky, who studied some of the Bir Amrane kimberlites in detail, the kimberlites are similar in all their petrographical, geochemical and mineralogical characteristics to the Group-1 kimberlites of South Africa.

The known kimberlites seem not related to the diamond and G10 occurrences further west in the Archean terranes of the Reguibat craton. Field evidence points to the presence of an as yet undiscovered Late Proterozoic kimberlite event on the Archean core of the craton.