Garnet texture and chemical zoning: 
a clue for the history of the
Mayombe (Congo-Brazzaville)

V. BOUENITELA 1,2*, M. BALLEVRE 1, 
and F. BOUDZOU MOU 2

1Géosciences Rennes (UMR 6118), Université de Rennes1, 
35042 Rennes Cedex, France (*correspondence: 
vicky.bouenitela@univ-rennes1.fr) 
2Département de Géologie, Faculté des Sciences et 
Techniques, Université Marien NGOUABI, Congo

Structural and geochronological data in the Mayombe belt 
show evidence of two orogenic events: Eburnean (c. 2000 
Ma) and Pan-African (c. 600 Ma). However, the distribution, 
amount and P-T conditions of Pan-African reworking of the 
older Eburnean basement is a matter of debate. To solve this 
question, a detailed petrological study of the metamorphic 
history of the Mayombe belt has been undertaken.

Garnet is a key mineral for understanding the tectono-
metamorphic history of the Mayombe since it preserves a 
record of P-T conditions during its growth, expressed by 
chemical zoning, and it may also display some inclusion 
trails which can give kinematic indications. Field, textural 
and chemical analyses of garnets from the metamorphic rocks 
of the Mayombe belt reveal the existence of (i) magmatic and 
metamorphic garnets, (ii) normal and reverse growth zoning, 
(iii) narrow diffusion zoning along cracks and rims, and (iv) 
multistage garnets recording metamorphic overgrowths 
around magmatic cores.

Growth zoning of the metamorphic garnets shows evidence 
for one major tectono-thermal cycle, whose age is under 
investigation using isotopic techniques. Modification of 
magmatic garnet by diffusion, and the development of 
chlorite around garnet crystals, along cracks and in the 
associated matrix may have been the main effect of the Pan-
African overprint on the Eburnean basement.

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