*Geochemistry of Desirade Island rocks (Guadeloupe, French Antilles)

GAUCHAT Karine; Mars 2004

Supervisor: Prof J. Hernandez , Institut de Minéralogie et Géochimie

Desirade is a 22km2 island located 8 km East from Guadeloupe on Lesser Antilles arc. The Desirade Island is divided in 5 units : the Phare unit consists of sub horizontal pillow basalts, cherts and pyroclastite, the Baie-Mahault unit consists of tilted pillow basalts, the Grand-Abaque unit consists of brecciated flows and scorias, the Kikali unit display an association of trondhjemites and diorites and the Fregule unit an association of dacites and rhyolites. Those units are crosscut by E-W andesitic dykes. NE-SW dykes are observed only in the Phare unit.
This study indicate that the Desirade scarp on the northern part of the island is linked to Caribbean geodynamics. Study of the sedimentary cover indicate that Desirade uplift is pre-Pliocene.
Traces and rare earth elements display distinctive negative Nb and Ti anomalies and La/YbN ratios close to 1 in Baie-Mahault, Grand-Abaque, Kikali and Fregule units indicating a tholeiitic arc affinity. Phare basalt trace and rare earth elements display negative Nb and Ti anomalies and La/YbN ratios close to 4 indicating a calc-alkaline arc affinity. Trace and rare earth elements indicate that the Desirade Island is not an oceanic fragment.
Desirade rocks Pb, Sr, Nd and O isotopic compositions indicate derivation from a MORB type mantle source contaminated by 1 to 5 % of Pacific sediments.
Comparison of Desirade rocks with other upper Jurassic fragments in Cuba and Puerto Rico indicate a similarity of the source. Desirade Island is linked to a Jurassic arc dismembered by Caribbean plate emplacement.