MAGMATIC AND STRUCTURAL DATA ON THE EARLY CRETACEOUS ISLAND ARC SERIES FROM SAUCITO-ZACATECAS (CENTRAL MEXICO).

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Cordilleran terranes that are widespread along western Mexican coast also are represented in the state of Zacatecas (Zac), as discontinuous remnants of a larger tectonic unit thrust upon the Mesozoic platform carbonates of eastern Mexico. This unit mainly consists of submarine volcanics similar to those defined 300km more to the south near Guanajuato (Ortiz, 1988, Monod et al. 1990). However, direct connexion could not be ascertained unless proper geochemical criteria could be identified.

Near Saucito (45km east of Zacatecas), massive basaltic flows and pillowed lavas alternating with thinner horizons of black radiolarian cherts and finely bedded mudstones are part of a thick volcanic and sedimentary series that are well exposed near Zacatecas and south of Fresnillo (de Cserna 1976). This series tectonically overlies black marbles of unknown age. Isoclinal folding in the limestone beds and faulting parallel to the bedding indicate a strong tangential displacement of the unit, probably to the NE.

Radiolaria extracted from the cherts ( ) are late Jurassic to early Cretaceous in age, as those described by Davila (1981) from Fresnillo.

Basalts present an interstratified to hyalopililitic texture. The groundmass contains abundant fiamelles of plagioclace and pyroxene. Phenocrysts are composed of clino-
pyroxene, and rarer spinels and Fe-Ti oxides. These rocks have undergone a green schist metamorphism with Chl+/−Epid+/−Cac+/−Alb+/−Celadonite+/−Fe oxides. Clino-
apyroxenes are augitic (Wo40, En45, Fs15 to Wo45, En45, Fs10) with Ti+Cr (0.0106−
0.0354) and Ca (0.772-0.865) typical of orogenic lavas of thoelitic affinity (Leterrier et al. 1982). Basalts are Al rich(?) (Al203-13-15%) but poor in K2O (1%). They are also poor in Ca (CaO=9.5-12%), Mg (MgO 5.5%), Cr (147 ppm) and Ni (82 ppm). Conversely, TiO2 is high (1-1.5%) owing to the accumulation of Fe-Ti oxides. Rare earth ratios Y/Nb (3.5-4.4) and La/Yb (2.018-2.838) are consistent with those from Island arc thoel-
lites (Pearce & Cann 1973).

Extended diagrams normalized to MORB are characterized by 1) generally low K2O values, 2) higher Nb values (5-6) than in typical arc thoelites. These values, however, are considered as specific of the thoelitic basalts of the Guanajuato region (Ortiz 1990), 3) Finally, high Zr values (50-118) also are typical of island arc thoelites, but being higher here than in Guanajuato, suggest a longer differenciation.

In short, the geochemical features of the volcanic series near Saucito are very close to those found in Guanajuato (Ortiz, 1988), and strongly support that this series is a part of the same island arc which should also include Zacatecas and Fresnillo magmatic series.

Abstract

Munich, 1990

12th Geowissenshaftsches
Lateinamerika Kolloq.
21-23 XI 1990