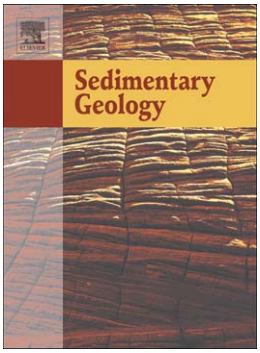

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Geochemical signatures of bedded cherts of the upper La Luna Formation in Táchira State, western Venezuela: assessing material provenance and paleodepositional setting

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Abstract: Here we undertook an inorganic geochemical study of Cenomanian-Campanian bedded cherts (the Táchira Ftanita Member of the La Luna Formation) in the western region of the Táchira State, Venezuela. The aim of this study was to determine the paleo-oceanographic and paleo-environmental conditions that governed the deposition of chert beds and put forward a sedimentation model for the Táchira Ftanita Member in the study area. Seventy-two chert samples were collected and trace/rare earth elements (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Rb, Cs, Th, U, Y, Co, and Sc) and major/trace elements (SiO_2, TiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, Na_2O, K_2O, P_2O_5, Mn, Ba, Sr, Cr, Ni, and V) were determined by ICP-MS and ICP-OES, respectively. On the basis of the stratigraphic abundance and distribution of relatively immobile elements, as well as the distribution of rare earth elements, we established that the detrital sediments associated with the sequences studied have matching characteristics with distinct continental materials, with an intermediate composition, thus pointing to the Guayana Massif as the main source of sediments. In addition, we also determined the influence of hydrothermal input on the chemical composition of some cherts from La Molina Mine. On the basis of geochemistry, we found a biological influence regarding the uptake of dissolved silica for forming chert beds. The application of parameters for relatively immobile elements allowed us to establish a still proximal continental-margin (hemipelagic) for most samples from the Zorca River and a continental-margin for almost all the cherts from the Delicias-Villa Páez section and the remaining samples from La Molina Mine. Finally, we propose that the rhythmicity that accompanies the sequence of bedded cherts is related to changes in the intensity of upwelling patterns of water and/or to variability in the supply of silica dissolved in the Táchira sub-basin.

Keywords: bedded chert, Táchira Ftanita Member, depositional setting, provenance, modified Murray diagram.

1. Introduction

The geochemical study of bedded chert sequences has wide application in the context of determining their genesis (Chen et al., 2006), depositional environments (Murray, 1994; Halamić et al., 2005; Yu et al., 2009; Udchachon et al., 2011; Kemkin and Kemkina, 2015), paleogeographic

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