



## **Genesis of phosphatic deposits in marine tuffs from Patagonia, Argentina**

N. Rubinstein (1), A. M. Fazio (1), R. A. Scasso (1), S. Carey (2)

(1) Universidad de Buenos Aires, Departamento de Geología, Pabellón 2, Ciudad Universitaria, (1428) Buenos Aires, Argentina

(2) Graduate School of Oceanography, University of Rhode Island, Narragansett Bay Campus, 02882 R.I. USA

(nora@gl.fcen.uba.ar)

The Neogene Gaiman Formation, deposited in a shallow marine environment, crops out in Chubut Province, Patagonia, Argentina. This formation shows the unusual occurrence of phosphatic deposits associated with glassy tuffs beds. The study of the chemical and textural changes in the glass shards allowed unraveling the phosphogenic processes. Isocon diagrams were useful for determining chemical changes during diagenesis as gains in LOI and Ca and losses of K. These changes were the result of glass hydration due to seawater-glass interaction followed by adsorption and diffusion of ions into the bulk shard, reflecting an incipient process of volcanic glass replacement. Subsequently, incongruent dissolution produced pitting and the development of a reactive surface in the shards borders, which favored P and Ca enrichment. Lastly, precipitation of calcium phosphate filled the open cavities inhibiting glass dissolution. In this way, the high porosity and reactivity of the volcanic glass provided an appropriate substrate for phosphate precipitation, yielding to the development of authigenic apatite in the volcanic-glass bearing strata of the Gaiman Formation.