

# Mineralogical and Technological Study of the “Blue Stone” Used in the San Juan Church Construction Arucas.Gran Canaria.

/CARLOS DE LA FUENTE CULLELL (\*), MERCEDES OVEJERO ANDIÓN

Departament de Cristal·lografia, Mineralogía i Dipòsits minerals. Facultat de Geologia. Universitat de Barcelona. C./Martí i Franqués, s.n. – 08028- Barcelona (Spain)

## INTRODUCTION.

The church of the San Juan Baptist in the Gran Canaria municipality of Arucas, is a neogothic temple constructed in XX century, according to the Catalan architect Project D. Manuel Vega March presented in 1908. It began to be constructed the 19 of March of 1909, and was opened to the worship in 1917, although the architectonic tasks extended until 1977, with several temporary interruptions. Like in the previous centuries, this church was constructed by hand, without technology or mechanization of any tipe and constitutes a good example of the hability and participation in the works of many stonemasons, laborers and workers, appearing between its construction foremen, laborers with reputation in the island like Sebastián Quesada, Miguel Santana, Pedro Morales and Francisco Santana.(Fig. 1).



Fig. 1. San Juan Church. Arucas.

The grandeur of its stony structure has caused that, without being it, this temple is known as the “Arucas cathedral” and nowadays constitutes a

representative sampe of the recent canary religious architecture and is an identifying symbol of the town of Arucas.

## THE “BLUE STONE” OF ARUCAS.

Its artisan construction was very conditioned by the stonecutting rock used: the “blue stone” of Arucas.

In this work the mineralogical and petrologic nature of the Arucas “blue stone” is studied, and their technological properties and durability are evaluated (Ovejero, M., 2005).

The chemical analysis of this rock is made by X-rays spectroscopy fluorecence and the mineralogical analysis by an X-rays difractometry (Aubert, G. et al., 1978; Lemeyre, J., 1996).

Several tests were made as well on standardized test tubes (ASTM) to determine the percentage of water absorption (ASTM C97-47 (77)); the specific weigth (by means of pycnometer); the bending resistance (ASTM C97-52 (76)); the compressive strength in dry (ASTM C170-50 (76)) and the resistance to the mechanical wearing down or abrasion (ASTM C241-51 (76)).

## RESULTS AND DISCUSSION.

The chemical and mineralogical analyses results along with the textural determination done on thin sheet with petrographic microscope allows us to conclude that the Arucas “blue stone” is a traquifonolitic ignimbrite, rock whose existence is congruent with the geologic context of this North part of the island (Araña,V, 1978; Pérez-Torrado,J.F. 2008) The collected data, average of three

measurements, are:

Water absortion.....4,46 %  
Specific weight.....1,96  
Bending resistance.....192,3 Kg/cm<sup>2</sup>  
Compressive strength.1.672,8 Kg/cm<sup>2</sup>  
Resistance to abrasion or mechanical Wearing down.....15 %

These data guarantee a suitable durability of this architectonic material. In addition the “blue stone” of Arucas is a rock extracted in local quarries, which guarantees a simple material replenishment (Rothe, P., 1986).

The churh of San Juan in Arucas has a century of existence, and the “blue stone” with which is constructed, due to their petro physical characteristics, augurs to it several centuries more, with which the so-called Arucas cathedral, will continue being the most emblematic building of this pretty town of Arucas (Gran Canaria) for a long time.

## REFERENCES.

- Araña, V., Carracedo, J.C. (1978): *Los volcanes de las Islas Canarias. Vol III. Gran Canaria. Ed. Rueda. Madrid. 173*
- Aubert, G., Guillemin, C., Pierrot, R. (1978): *Précis de Minéralogie. Ed. Masson-BRGM. Paris. Orleáns.335 p.*
- Lameyre,J. (1986) : *Roches et Mineraux. Ed. Doin. Paris. 350 p.*
- Ovejero Andión,M., (2005): *Caracterización petrofísica y alterabilidad de rocas ornamentales de la provincia de Castellón. Tesis doctoral. Universitat Jaume I. Castellón. 238 p.*
- Pérez Torrado,J.F., Cabrera, M.C.(2008): *Itinerarios geológicos por las Islas Canarias. Nº 5.Gran Canaria .VII Congreso Geológico de España.157 p*
- Rothe, P. (1986): *Sammlung Geologis -cher Führer.Nº 81. Kanarische Inseln. Gebrüder Borntraeger.Berlin.226 p.*

**palabras clave:** Propiedades tecnológicas, "Piedra azul", Ignimbrita, Durabilidad.

**key words:** Technological propierties, "Blue stone", Ignimbrite, Durability.

