

## Electrical properties of glasses and glass-ceramics obtained from Canary Islands basalts

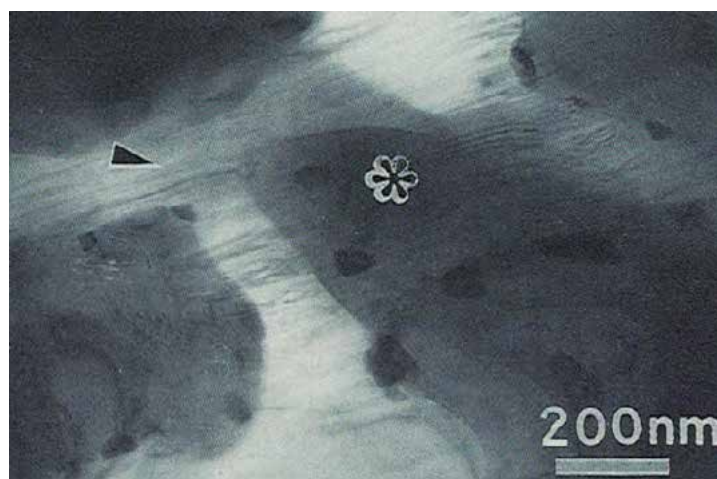
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Some glasses and glass-ceramics obtained from Canary Islands basalt rocks (La Gomera Fuerteventura, Tenerife and El Hierro) have been obtained by controlled melting and recrystallization. The electrical measurements have been carried out under complex impedance at temperatures in the 250°C-700°C range. From these electrical determinations, it was possible to follow the evolution of original glasses with respect the nucleation and crystal growth process. The main crystalline phases were pyroxenes, feldspar (anorthite) and magnetite. The magnetite decorates the dendritic crystallization of pyroxenes and it is the responsible phase of the electrical conduction properties. The ratio between Fe<sup>2+</sup>-Fe<sup>3+</sup> was related to the Fe<sup>2+</sup>/Fe total content in the final materials allowing to propose an electronic conduction model.



**Figure 1:** TEM micrograph of dendrites edges in a basalt glass-ceramic from Tenerife melted in reduced atmosphere (sample VRTF1)

### Biography

Jesús Ma Rincon is a Senior Research Professor (Profesor de Investigación) at the Instituto E Torroja de Ciencias de la Construcción, CSIC, Madrid, where he is the Founder and Head of the Glass-Ceramics Laboratory. He was General Secretary of the Spanish Glass and Ceramic Society and Editor-in-Chief of *Bol. Soc. Esp. Ceram. Vidrio*. He has conducted electron microscopy on ceramics, glasses and glass-ceramics and their raw materials, being author of seven monograph books and more than 170 papers in glass-ceramics and advanced ceramics. He was invited Professor at the Department of Materials Science and National Electron Microscopy Lab, University California, Berkeley, during 1984-85 working in zirconia/mullite composites. Since last 15 years, he is active in the vitrification and recycling of a wide range of residues, up to simulated radioactive industrial wastes. Recently, he was the past President of the Spanish Society of Scientists.

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