Local Structure of Europium Sites in Oxide Glasses by Nuclear Gamma Resonance

Giorgio Concas, Giorgio Spano, Marzia Carrada, Marco Bettinelli[a], and Adolfo Speghini[a]

Dipartimento di Fisica, Università di Cagliari and Istituto Nazionale per la Fisica della Materia, S.P. Monserrato-Sestu km 0,700, I-09042 Monserrato (Cagliari), Italy

[a] Dipartimento Scientifico e Tecnologico, Università di Verona, Ca' Vignal, Strada le Grazie, I-37134 Verona, Italy

Reprint requests to Dr. G. C.; Fax: +39 070 510171, E-mail: gconcas@vaxca1.unica.it

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The symmetry and disorder of the Eu^{3+} site was investigated in some phosphate and borate glasses by means of ^{151}Eu Mössbauer spectroscopy. The quadrupole interaction parameter, which is due to the distortion of the Eu site compared to a cubic symmetry, has been measured together with the asymmetry parameter, which points out the absence of a threefold or fourfold axis of symmetry at the rare earth site. The correlation of the isomer shift with the optical basicity of the glass indicates a covalent component with 6s character in the Eu-O bond. The axial component of the electric field gradient at the Eu site is also correlated with the optical basicity.

Key words: Europium; Oxide Glasses; Phosphates; Borates; ^{151}Eu Mössbauer Spectroscopy.