

DEVELOPMENT OF A CERAMIC COMPOUND FOR COATING THE WALLS OF IMAGE DIAGNOSIS CENTRES FOR DOSE REDUCTION OF THE MEDICAL TEAM

Audrew Frimaio

Instituto de Pesquisas Energéticas e Nucleares, National Commission of Nuclear Energy,
Av. Prof. Lineu Prestes 2242, 05508-000 São Paulo SP, Brazil
E-mail: audrew@sealtech.com.br

Paulo Roberto Costa

Instituto de Eletrotécnica e Energia, University of São Paulo,
Av. Prof. Luciano Gualberto 1289, 05508-010 São Paulo SP, Brazil
E-mail: pcosta@iee.usp.br

Flávia V.F. Vanderlinde

Núcleo de Cerâmica, SENAI School 'Mario Amato',
São Paulo SP, Brazil

Letícia L. Campos*

Instituto de Pesquisas Energéticas e Nucleares,
National Commission of Nuclear Energy,
Av. Prof. Lineu Prestes, 2242, 05508-000 São Paulo SP, Brazil
E-mail: lcrodri@ipen.br
*Corresponding author

Abstract: This study aims to formulate a ceramic compound for coating walls to be used as protecting barriers at image diagnostic centres, with the purpose of reducing the radiation doses to which professionals and the public are exposed. The attenuation properties towards ionising radiation of different commercial ceramic materials and formulations were experimentally studied using X-rays with effective energies between 20 and 55 keV and theoretically using Archer's model for the calculation of protective barriers. Those samples that presented larger densities and attenuation coefficients were selected, considering the production process facility and low cost. The samples based on the ceramic support *grês* were chosen, owing to their attenuation properties and wide application as a coating material. Different *grês* formulations were simulated and evaluated applying the software XCom and TBC model for X-ray spectra generation and the results were compared with reference material containing 4 mm of lead.

Keywords: ceramic coating; ceramic shielding; image diagnosis; protection from radiation; radiation attenuation; X-ray radiation.