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São Paulo, April 9, 2008

TECHNICAL REPORT ON THE LINEAR ATTENUATION COEFFICIENT μ OF GAMMA RADIATION FOR BARITE MORTAR

Product: BARITE MORTAR GRX-EAS
Manufacturer: GRUPO GRX-EAS
Manufacturer address: Rua Epaminondas Luiz Amorim, 277-A, Lauzane Paulista, São Paulo, SP, BRASIL

The barite mortar linear attenuation coefficient μ was determined by high resolution gamma-ray spectrometry with HPGe detector, using five radioactive standard gamma-ray sources, Co-57, Cd-109, Ba-133, Eu-152 and Am-241.

Six barite mortar probes, manufactured by GRUPO GRX-EAS, each one measuring 5 x 5 x 1 cm, were gradually inserted between the collimated source and the HPGe detector.

The linear attenuation coefficient was experimentally determined for every gamma transition emitted by the radioactive sources, measured with and without the barite mortar probes. The relationship between the linear attenuation coefficient μ (cm^{-1}) and the photon energy was calculated using the particular values of those coefficients.

The linear attenuation coefficient μ is calculated through the equation:

$$\mu = A_1 * \exp (-E/t_1) + A_0$$

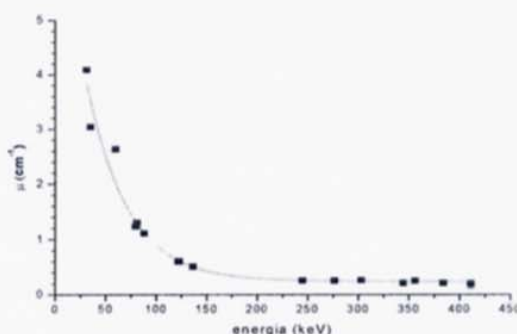
with: $A_0 = 0,250 \pm 0,001$

$A_1 = 7,80 \pm 0,04$

$t_1 = 40,2 \pm 0,1$

Where: μ = linear attenuation coefficient in cm^{-1}

E = photon energy in keV



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As the linear attenuation coefficient of gamma radiation is strongly dependent on the absorber composition and homogeneity, in the particular case of the barite mortar, any change in its composition and preparation may change the linear attenuation coefficient values.

Therefore, it is highly recommended that the end user remakes the entire procedure described above for each barite mortar probe used, if different.

The results above refer only to the analyzed sample as the responsibility of preparing the barite mortar probes is uniquely of the manufacturer.

The responsibility of all other information, not directly related to the linear attenuation coefficient and the measurement method, are uniquely of the manufacturer.


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