calculation of the energy deposited in biological systems in order to obtain the absorbed dose(and kerma) needs an accurate RF that takes into account the effects related not only with the full absorption of photons(photoelectric effect) but the partial absorption (continuous components and the incomplete charge collection due to trapping and recombination of charge carriers) as well. Finally, to describe the multiple Compton scattering in germanium crystal, we performed an empirical approximation which shows a good agreement between the experimental spectra measured for two germanium detector crystals and the model proposed. The approximation was tested for a 50 cm^3 and 89 cm^3 coaxial germanium crystals and for energies ranging from 200 keV to 1.5 MeV. References [1]J.Y. Zevallos-Chávez, M.T.F. da Cruz, M.N. Martins, V.P. Likhachev, C.B.Zamboni, S.P.Camargo, F.A.Genezini, J.A.Medeiros, M.M.Hindi,Nucl. Instr. and Meth. A457(2001)212-219 [2]C. Lee Myung, K. Verguese, R.P. Gardner, Nucl. Instr. and Meth. A262(1987) 430

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Routing Interface for Multidetector Angular Correlation Spectrometer

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A routing interface has been built for simultaneous acquisition of four gamma–gamma coincidence spectra. The routing interface will be used in conjunction with a multichannel analyzer having four multiplexed inputs (Ortec EtherNIM model 919) coupled to the angular correlation spectrometer consisting of five germanium detectors. In this system one of the detectors (A) is used to detect a given gamma ray (γ_1) and the other four detectors (b, c, d, e), placed at different angles with respect to (A), register gamma spectra in coincidence with (γ_1) allowing for simultaneous measurement of several gamma–gamma directional correlations. The angular correlation spectrometer will be used, in our laboratory, for the nuclear structure study following the radioactive decay. The new interface will allow a considerable reduction in the experimental data acquisition time and an improvement in the precision of the final results at a smaller cost than that of the standard CAMAC system used in other laboratories.
The performance of the routing interface was evaluated through several test measurements, which included acquisition of gamma–gamma coincidence spectra using standard radioactive sources like ^{60}Co and ^{152}Eu, energy resolution and linearity of the system. The results of these tests are discussed. The test experiments demonstrate correct and efficient performance of the constructed interface.

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Development an calibration of a flux gas counter for application in conversion eletron Mö ssbauer spectroscopy

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Conversion electron Mössbauer spectroscopy (CEMS) has been used as a standard technique in various fields of Physics, Materials Science and Physical Chemistry since details for the construction of appropriate gas counters were reported. Recently, many works have appeared on the application of CEMS but a simple description of the methodology of detection is lacking. In this work the methodological aspects of this technique are discussed in basis of the construction and calibration of a standard gas counter detector. When a nucleus jumps to an excited state, it can revert to the ground state either by a radioactive process involving the emission of a fluorescent photon or by a radiationless transition also knows as internal conversion. In the latter process the excited nucleus interacts with a core electron, thereby maintaining the laws of momentum and energy conservation. The energy of the excited state, E_e, is partly used to unbind the core electrons, E_b, the rest providing this electron with a kinetic energy, E_k (E_k=E_e-E_b). After internal conversion the atom remains with a hole in a core level and there are many different ways by which the ground state may be achieved. Although the appropriate synchronization of source velocity and the detection of backscattered photons from the sample (fluorescent of 14,4 keV and K_α X-ray emitted after K-conversion in ^{57}Fe) allow resonance to be traced, and the detection of scattered electrons is a superior technique in cases where the outer part of the sample is to be studied. However, it is still necessary to examine the several aspects of system of detection involved in this technique.