Gamma Ray Spectroscopy Studies on Low and Intermediate Level Radioactive Waste from Angra-1 Nuclear Power Plant

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The determination of the radionuclide composition of low - and intermediate - level radioactive waste is of paramount importance for the design and implementation of Brazil‘s planned radioactive waste repository. While there is some knowledge of the radionuclides expected to be present, the exact activity values in each of the waste bins are not determined with sufficient precision, so theres an ongoing effort to analyze the composition of this waste and make the radioactive inventory of the bins containt, which comprises several institutions and laboratories. In the present work the gamma - ray spectroscopy of samples of resin, filters and evaporator concentrate from Angra 1 nuclear power plant have been studied. Small aliquots ($\sim$ 500 mg) of the distinct samples were stored in glass vials and gamma- counted in a characterized high resolution germanium detector. In order to determine the best counting time, these aliquots were counted for 24h (real - time), with the spectroscopy results saved after each full hour of counting. The resulting twenty four spectra were then analyzed with Canberras Genie - 2000 software, using ISOCS efficiency correction tool. The results for each sample were then compared to determine the required counting time for each of the radioisotopes of interest.