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The use of coincidence summing effect in γ spectrometry for the determination of full energy photopeak efficiency and activity of the ⁶⁰Co-60 point source

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A study of coincidence summing of gamma-rays of Co-60 has been presented. In
gamma-ray spectrometry with germanium detectors, the summing effect have to be taken into account at low source detector distance. The peaks due to coincidence summing of X+X, X+gamma,gamma+gamma rays can complicate the spectrum obtained by this type of the detector and signicantly change the counting rate of single peaks. There is theoretical model developed for coincidence summing of X and gamma rays for radionuclides with complex decay scheme. This models enables to write equation for single peaks, the coincidence sum peaks and total count rate. The efficiency of detection and the activity of Co-60 source are the unknowns in the count rate equation system. They can be determined by simultaneously finding the roots of the equation system.

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