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Gas gain limitation in low pressure proportional counters filled with TEG mixtures

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In the past few years, miniaturized tissue- equivalent gas detectors operating at a nanometric level down to 35 nm, have been developed for application of microdosimetry in radiotherapy.

It should be stressed that single ionization events dominate the distribution of low-LET radiation in nanometric sites and therefore their detection is of primary importance. A higher gas gain is necessary for reducing the simulated site.

The gas gain factor has been measured for C₃H₈/CO₂/N₂/55/39.6/5.4, CH₄/CO₂/N₂/64.4/32.5/3.1 and Ne/C₂H₄/C₂H₆/N₂/41/39/16.7/3.3 TEG mixtures.

The scope of the measurements was to find the highest stable gas gain, its dependence of TEG mixture pressure and counter geometry. Obtained results will be presented.

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