

Effect of the electric field on the primary scintillation from CF₄

The effect of electric field on the CF₄ primary scintillation in the ultraviolet (220 –500 nm) and visible (500 – 800 nm) wavelength regions is presented. The study was performed in the pressure range from 0.5 to 5 bar and at electric fields up to 2000 V/cm, which are the typical fields used in HEP and radiation imaging detectors. The primary scintillation was characterized using several complementary techniques. Emission spectra, fully corrected for the detection response and the absolute photon yields in the UV and visible regions are reported. Additionally, time resolved measurements were performed for two wavelength regions, one in the UV and one in the visible wavelength region.

The emission spectra show a significant variation with the applied field: The photon flux in the visible strongly reduces with the field, while the flux in the UV shows a moderate increase. Also, the spectral profile of the UV emission is affected by the field at the highest pressures. The time spectra of the UV emission do not change with the field in contrast with the visible emission which exhibits a moderate shortening of the decay time. The effective decay time of the UV and visible emission is less than 20 ns for all the conditions.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

http://mars.fis.uc.pt/~margarida/Morozov_VCI09.pdf

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