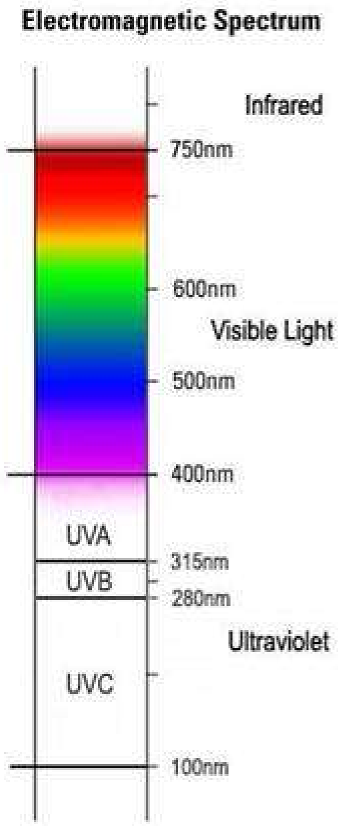
Films



band gap GaN: 3.4 eV

$$E = \frac{hc}{\lambda}$$

Donde E es la energía de lo
son ambas constantes, la en

Para encontrar la energía de

$$E(eV) = \frac{1.2398}{\lambda(\mu m)}$$

1 NANOMETRO = 0.001 MICROMETRO

E(eV)=1240/lambda(nm)

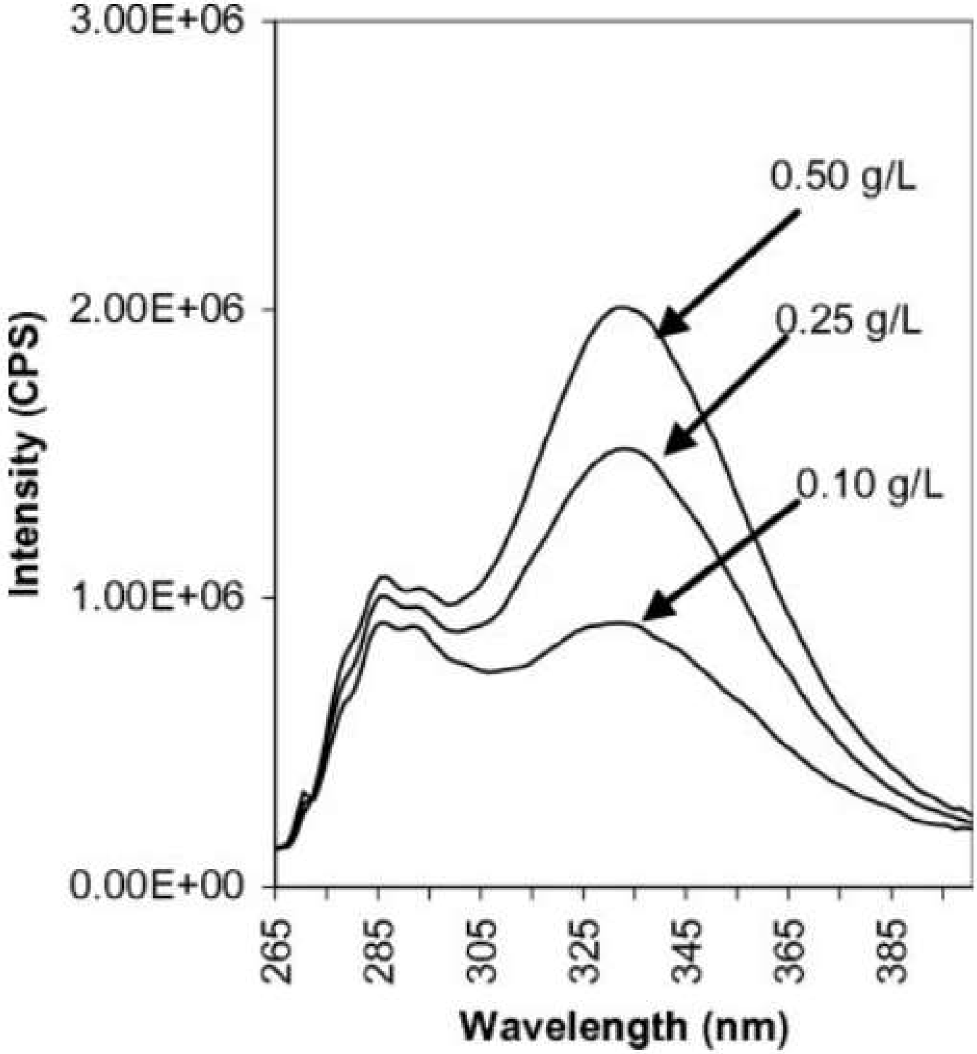


Figure 1 Fluorescence emission spectra of polystyrene ($\bar{M}_w$ = 223,200) at three concentrations in decalin at 20°C (excitation at 250 nm). The band at 285 nm is the fluorescence due to polystyrene monomer, while the band at 332 nm is due to polystyrene excimer.

E=1240/335=3.7 eV re bien

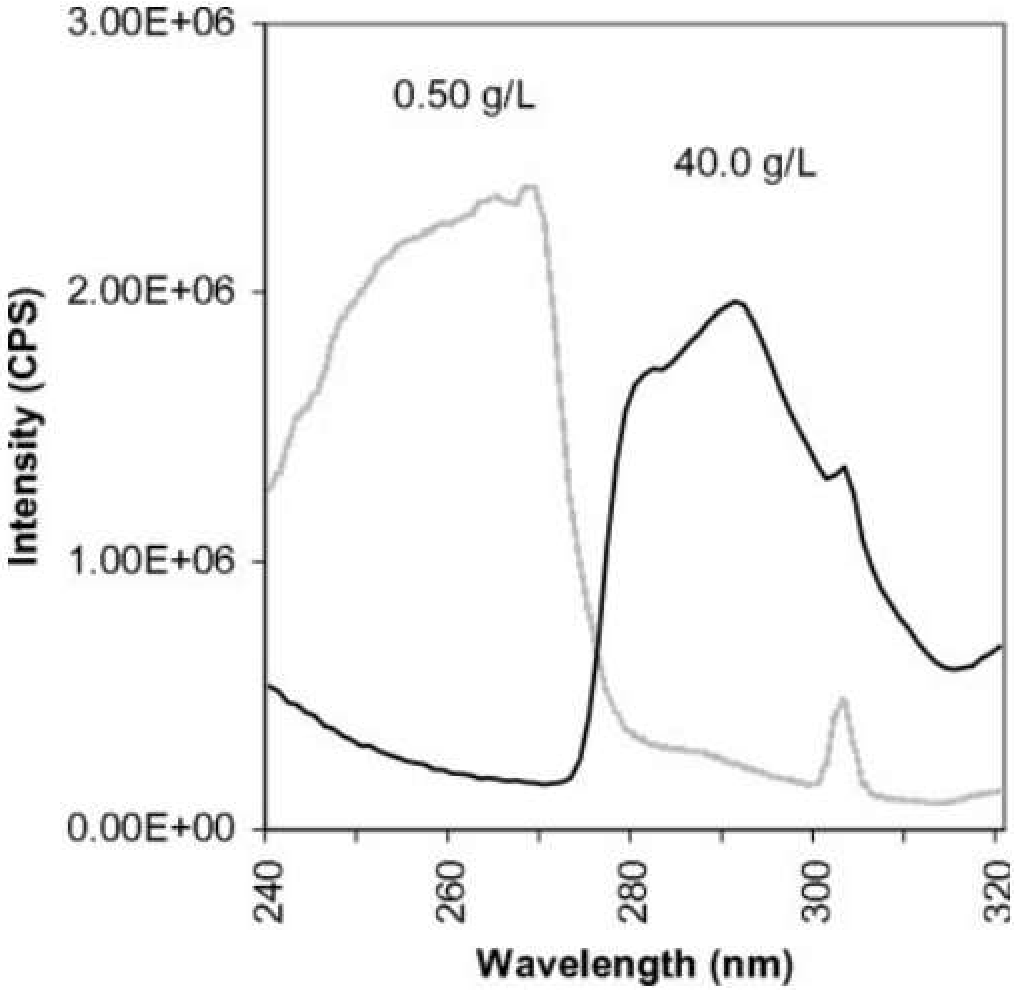
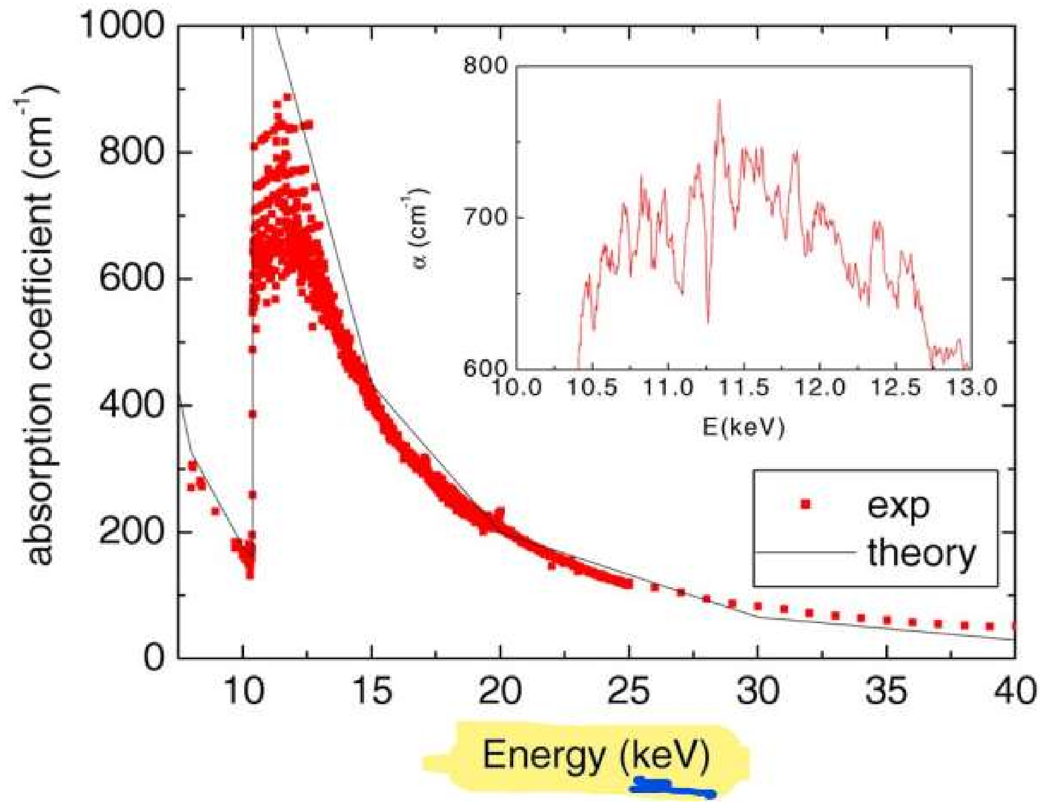


Figure 2 Fluorescence excitation spectra of polystyrene ($\bar{M}_w$ = 223,200) at two concentrations in decalin at 20°C (excimer emission at 332 nm). Light line, 0.5 g/L; dark line, 40 g/L. The band at 291 nm in the 40 g/L spectrum is assigned to complex formation. The relatively sharp peak at 304 nm is from Raman scattering.

los rayos X van de 10**-8 a 10**-10 m=== 10 a 0,01 nanómetros

E(eV)=1240/lambda(nm)= de 124 eV a 124 keV

absorcion de GaN para fotones ...



nos estaria faltando capturas los mas energeticos

PARTICULAS ALFA

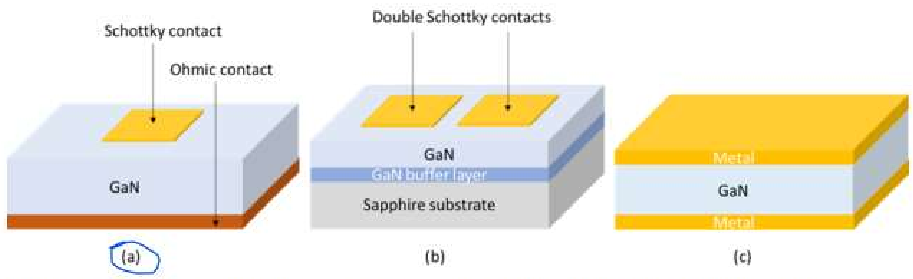


Figure 5. Schemes of the typical GaN devices used for the detection of alpha particles and neutrons, (a) SBD, (b) double SBD, and (c) MSM. Figure adapted from Ref. [5].

3.1. Radiation response to alpha particles and neutrons

The pioneering work on alpha particle detection was done by Vaikuts et al. [46]. They have achieved charge collection efficiency (CCE) of 92% for 5.84 MeV alpha particles (^{241}Am source) using the double SBD as shown in Fig. 5b. Additionally, Muligan et al. [47] have fabricated GaN SBDs (as shown in Fig. 5a) for measuring the response for alpha particles (^{241}Am source). They have obtained excellent results and a charge collection efficiency of 100 %.

Figure 6 shows the radiation response to alpha particles obtained by GaN SBD at different voltages (from – 400 up to −750 V) in a vacuum. CCE of 100% for 5.48 MeV alpha particles was achieved at −750 V [48].

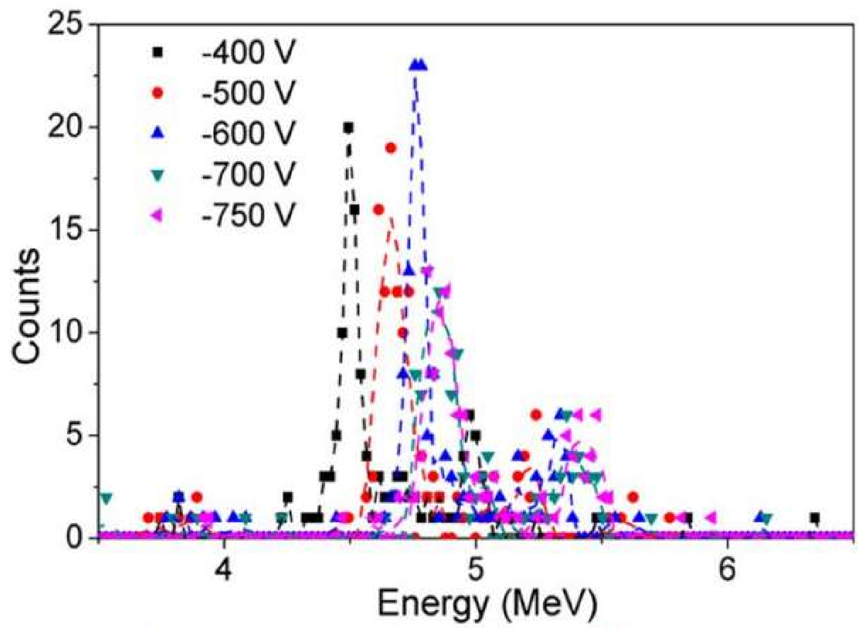


Figure 6. Radiation response of GaN SBD to alpha particles (^{241}Am source) at different voltages in vacuum. Data taken from Ref. [48].

CCE = charge collection efficiency

$$CCE = \frac{Q_{meas}}{Q_{gen}} \quad (21)$$

3.2.1 Alpha Particles

Figure 3 shows the measured charge collection efficiency as a function of forward and reverse bias for different neutron fluences. In reverse bias, charge collection efficiencies above 80 % can be

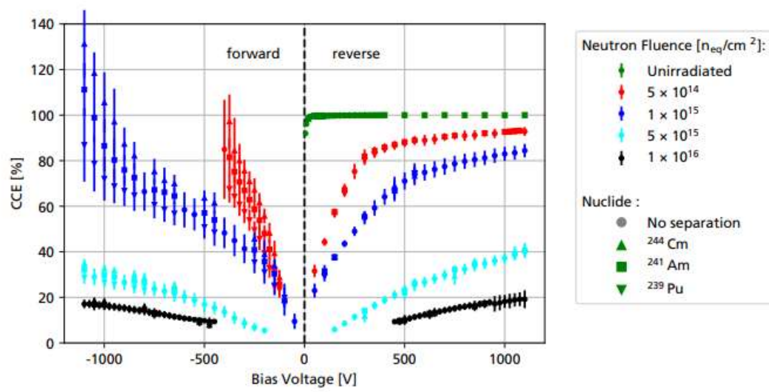


Figure 3: Charge collection for alpha particles in forward and reverse bias. The CCE has been normalized to each of the three isotopes present in the source where possible.

esto es para SiC (3.24 eV de bandagap)

Un ejemplo común de centellador que absorbe partículas alfa y emite luz ultravioleta es el centellador de plástico. Este tipo de centellador está compuesto por un material plástico, como el poliestireno o el polimetilmetacrilato (PMMA), que contiene átomos de hidrógeno y carbono.

Cuando una partícula alfa penetra en el centellador de plástico, interactúa con los átomos de carbono y libera electrones de baja energía. Estos electrones excitados pueden transferir su energía a los átomos de carbono y hacer que emitan fotones de luz ultravioleta. Esta luz ultravioleta puede ser detectada por un fotomultiplicador o un detector de fotodiodos, lo que permite la detección y el análisis de las partículas alfa.

Otro ejemplo son los centelladores orgánicos líquidos, como el xililbifenilo (PBD) y el 2,5-difeniloxazol (PPO), que también pueden absorber partículas alfa y emitir luz ultravioleta. Estos centelladores se utilizan en detectores de partículas alfa líquidos y ofrecen una alta eficiencia de detección.

PROPERTIES OF CSI(TI) SCINTILLATORS

Density (g/cm^3)	4.51
Melting point (K)	894
Thermal expansion coefficient (C^{-1})	54 x 10^{-6}
Cleavage plane	None
Hardness (Mohs)	2
Hygroscopic	Slightly
Wavelength of emission max. (nm)	550
Lower wavelength cutoff (nm)	320
Refractive index @ emission max	1.79
Primary decay time (ns)	1000
Light yield (photons/keV)	54
Photoelectron yield (% of NaI(Tl)) (for γ-rays)	45

PROPERTIES OF CSI(NA) SCINTILLATORS

Density (g/cm^3)	4.51
Melting point (K)	894
Thermal expansion coefficient (C^{-1})	54 x 10^{-6}
Cleavage plane	none
Hardness (Mohs)	2
Hygroscopic	Yes
Wavelength of emission max. (nm)	420
Lower wavelength cutoff (nm)	300
Refractive index @ emission max	1.84
Primary decay time (ns)	630
Light yield (photons/keV)	41
Photoelectron yield (% of NaI(Tl)) (for γ-rays)	85