

Gadolinium pyrosilicate $Gd_2Si_2O_7:Ce$ (GPS:Ce).

GPS:Ce crystals can be used for registration of γ -rays, X-rays and (due to presence of Gd) thermal neutrons. High light yield, fast decay (42 ns, no slow component) and absence of thermal quenching up to 150 °C are the basic advantages of this material.

Scintillation and physical properties

Crystal size – up to 20 mm dia. and 30 mm length;

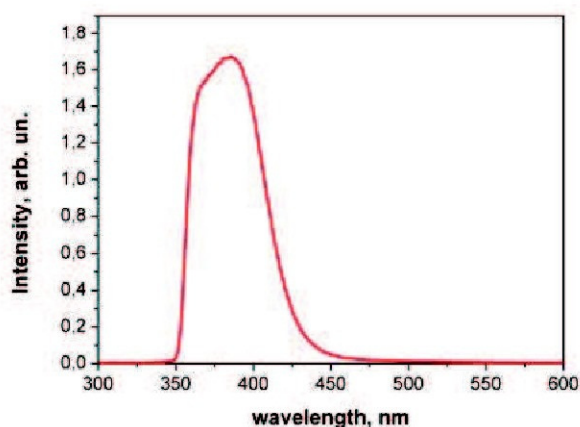
Light yield ~ 20000 phot/MeV;

Afterglow level – 0.2 % (after 20 ms)

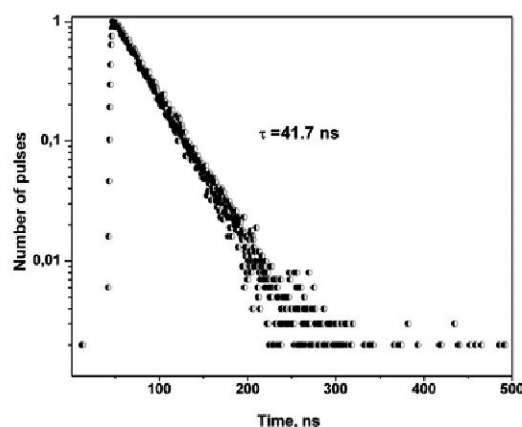
Density ~ 5.5 g/cm³

Decay time at γ -excitation - 41.7 ns

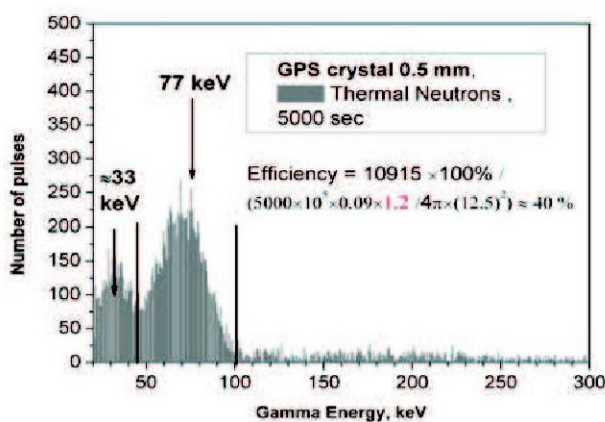
Hygroscopicity - no



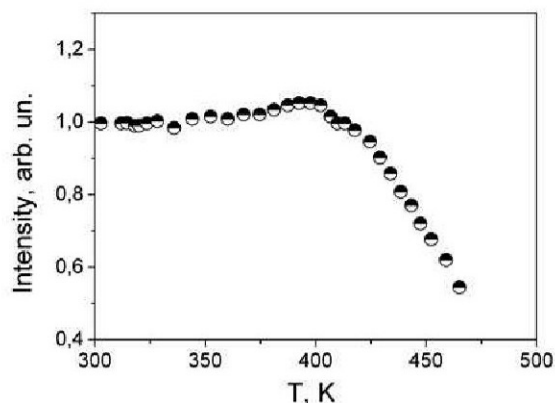
X-ray luminescence spectrum



Decay curve at γ -irradiation (662 KeV)



Energy spectrum at thermal neutron excitation



Temperature dependence of light yield