

Scintillator for slow and fast neutrons detection

New Organic materials discriminating neutron/gamma rays
Highly stable and easily processable Provides an alternative to ^3He detectors

KEYWORDS

Scintillator
neutron-gamma
discrimination
fast and slow neutron
detection

PATENT

FR3003256 B1

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Entry in national phases
in EP, USA

INVENTORS

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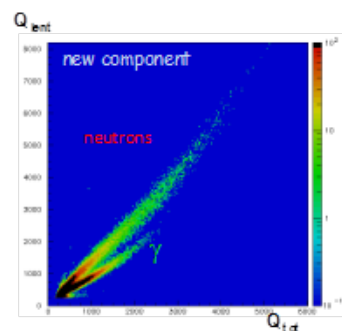
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IPCMS UMR 7504

IPHC UMR 7178

TECHNOLOGY

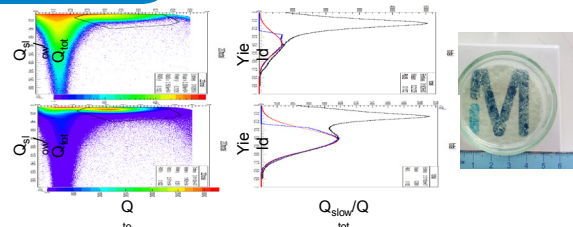
- Ionic Organic molecule with no vapour pressure, no-flammable and thermally stable...
- Able to discriminate fast neutrons/gamma radiation
- With equivalent efficiency to ^3He counters scintillating and discriminating
- Figure of Merit > 1,1 (AmBe source)
- Can form crystals



Total versus slow charges of the neutron signal for the new ionic liquid, irradiated by an AmBe source.

APPLICATIONS

- Nuclear-Defence
- Nuclear Industry
- Nuclear Academic Research



INNOVATION ADVANTAGES

- Ease of synthesis in bulk
- High modularity of the materials (Li, B doping; transparency; solid/liquid state)
- Heat and radiation resistant

DEVELOPMENT STATUS

- Optimisation of the synthesis
- Determination of the physico-chemical properties (>20 compounds)
- Batch production (kg scale)
- Transparency achieved over mm thickness
- $\epsilon = 0.05\%$ with 110keV neutron irradiation easily improvable (extrapolation to thermal neutrons: $\epsilon = 100\%$)
- Samples of 30 and 50 mm diameter available for assays

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