

# BC-523A

## Enriched Boron-loaded Liquid Scintillator

BC-523A liquid scintillator contains boron enriched in  $^{10}\text{B}$  to a minimum of 90%. The scintillator is useful in total absorption neutron spectrometry.

A fast neutron will produce a prompt recoil proton pulse with its initial scatterings in the liquid. Neutrons that are sufficiently thermalized within the scintillator are likely to undergo the  $^{10}\text{B}(n, \alpha)$  capture. The capture pulse is in delayed coincidence with the prompt pulse and is used to identify neutron events. For neutron energies below 200 keV, the capture time constant is determined solely by the  $^{10}\text{B}$  concentration. The average capture time is about 0.5 microseconds.

The scintillator also exhibits excellent pulse shape discrimination properties for neutron-gamma separation. References dealing with the performance of boron-loaded organic scintillators are listed on the back.

BC-523A is supplied sealed in ready-to use glass or metal cells. The liquid is sensitive to moisture, and you must take care to avoid exposing it to air if you perform your own encapsulation.

### Scintillation Properties

Light Output, % Anthracene .....	65
Decay time, short component, ns .....	3.7
Wavelength of maximum emission, nm .....	425
Bulk light attenuation, meters .....	>4

### Atomic Composition –

No. of H Atoms per cc .....	$4.98 \times 10^{22}$
No. of C Atoms per cc .....	$2.86 \times 10^{22}$
No. of O Atoms per cc .....	$0.811 \times 10^{22}$
No. of $^{10}\text{B}$ Atoms per cc .....	$0.243 \times 10^{22}$
No. of $^{11}\text{B}$ Atoms per cc .....	$0.027 \times 10^{22}$

### General Technical Data –

$^{10}\text{B}$ Content .....	4.41%
Density .....	0.916 g/cc
Refractive Index .....	1.415
Flash Point .....	-8°C

Scintillation Products  
Organic Scintillators



#### USA

Saint-Gobain Crystals  
17900 Great Lakes Parkway  
Hiram, OH 44234  
Tel: (440) 834-5600  
Fax: (440) 834-7680

#### Europe

Saint-Gobain Crystals  
104 Route de Larchant  
BP 521  
77794 Nemours Cedex, France  
Tel: 33 (1) 64 45 10 10  
Fax: 33 (1) 64 45 10 01

P.O. Box 3093  
3760 DB Soest  
The Netherlands  
Tel: 31 35 60 29 700  
Fax: 31 35 60 29 214

#### Japan

Saint-Gobain KK, Crystals Division  
3-7, Kojimachi, Chiyoda-ku,  
Tokyo 102-0083 Japan  
Tel: 81 (0) 3 3263 0559  
Fax: 81 (0) 3 5212 2196

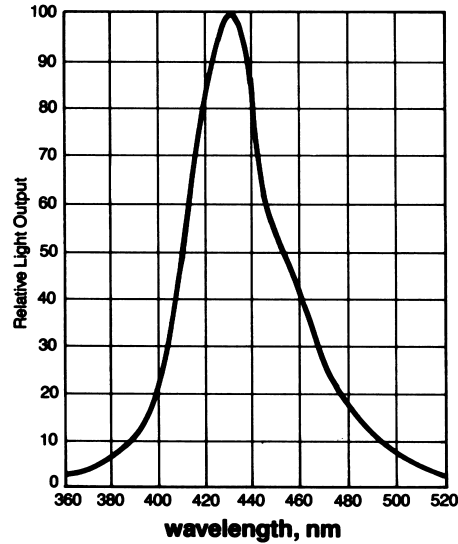
#### China

Saint-Gobain (China) Investment Co., Ltd.  
15-01 CITIC Building  
19 Jianguomenwai Ave.  
Beijing 100004 China  
Tel: 86 (0) 10 6513 0311  
Fax: 86 (0) 10 6512 9843

[www.detectors.saint-gobain.com](http://www.detectors.saint-gobain.com)

## BC-523A Natural Boron-loaded Liquid Scintillator

Emission Spectrum –



#### References:

1. L.W. Bollinger and G.E. Thomas, Rev. Sci. Instrum., 28, 489-496 (1957)
2. Von L. Sutterlin, Atomkernenergie, Vol. 12, NO. 7/8, 287,288 (1967)
3. L.R. Greenwood and N.R. Chellew, Rev. Sci. Instrum., 50 (4), 466-471 (April, 1979)
4. D.M. Drake, et al, Nucl. Instr. & Methods in Phy. Res., A274 576-582 (1986)

Manufacturer reserves the right to alter specifications.

©2005-8 Saint-Gobain Ceramics & Plastics, Inc. All rights reserved.

(08-08)