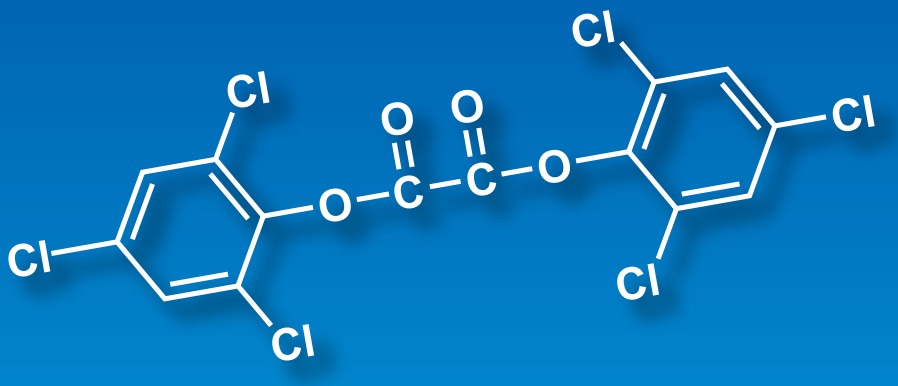
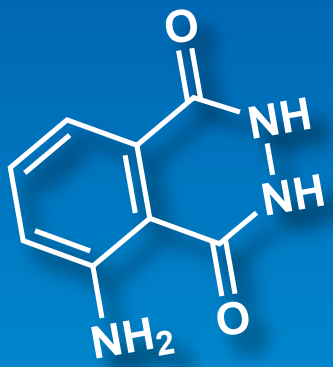
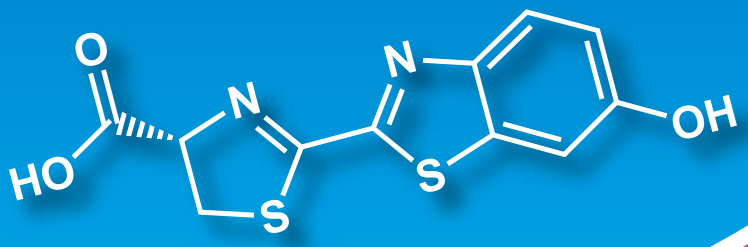
LIFE SCIENCE ANALYTICAL

Chemiluminescence Reagents







Chemiluminescence Compounds

Chemiluminescence Enhancers

Chemiluminescence Reagents

Chemiluminescence is the phenomenon of energy released as light when the excited state of molecules by oxidation returns to the ground state. Organic substances which exhibit chemiluminescene are *Cypridina* luciferin, firefly luciferin, oxalate, luminol, lucigenin, etc.

Cypridina luciferin analogs achieve chemiluminescence through reaction with superoxide (O_2^-) or singlet oxygen ($^1O_2$). Using this characteristic, CLA **[A5307]** and MCLA **[A5309]** have been used in the research of the functions of leukocytes. The maximum emission wavelengths of CLA and MCLA are 380nm and 465nm, respectively. FCLA **[A5310]** developed by Goto *et al*. is characterized by emitting light at a longer wavelength (532nm). Furthermore, Red-CLA **[A5311]** developed by Teranishi emits at an even longer wavelength. Red-CLA exhibits high emission intensity by reaction with superoxide, and can be used for efficient analysis of superoxide at the longest wavelength (610nm).

Firefly luciferin reacts with ATP in the presence of luciferase and magnesium ion to provide oxyluciferin via luciferyl-adenylic acid. The light with a wavelength of 562nm is emitted when activated molecules return to the ground state by decomposition of oxyluciferin. Using this characteristic, firefly luciferin is used in the trace detection of ATP and the activity measurement of nucleotide phosphatase and others.

Luminol reacts with hydrogen peroxide in the presence of metals such as iron or its complexes to emit strong blue light with a wavelength of 460nm. This reaction is called the luminol test and is applied to the identifi cation of blood stains in forensic science. Luminol is also used for trace detection of hydrogen peroxide and metals which catalyze this reaction.

On the other hand, oxalates are oxidized by hydrogen peroxide etc. to produce 1,2-dioxetanediones. When these substances are decomposed, they transfer energy to coexisting fluorescent substances which are elevated to the excited state. These excited fluorescent substances emit light during relaxation to the ground state. Thus, the emission wavelength can be changed by choosing coexisting fluorescent substances. This technique is applied to HPLC detection systems.

References

1) CLA
   a) T. Kobayashi, K. Saga, S. Shimizu, T. Goto, *Agric. Biol. Chem*. **1981**, *45*, 1403.
   b) M. Nakano, K. Sugioka, Y. Ushijima, T. Goto, *Anal. Biochem*. **1986**, *159*, 363.
2) MCLA
   a) A. Nishida, H. Kimura, M. Nakano, T. Goto, *Clin. Chim. Acta* **1989**, *179*, 177.
   b) A. Takahashi, H. Totsune-Nakano, M. Nakano, S. Mashiko, N. Suzuki, C. Ohma, H. Inaba, *FEBS Lett*. **1989**, *246*, 117.
   c) A. Takahashi, M. Nakano, S. Mashiko, H. Inaba, *FEBS Lett*. **1990**, *261*, 369.
   d) T. Sakurai, K. Sugioka, M. Nakano, *Biochim. Biophys. Acta - Lipids and Lipid Metabolism* **1990**, *1043*, 27.
   e) S. Koga, M. Nakano, K. Uehara, *Arch. Biochem. Biophys*. **1991**, *289*, 223.
3) CLA, MCLA
   a) M. Nakano, *Tanpakushitu Kakusan Koso* **1988**, *33*, 2699.
   b) H. Sawada, M. Nakayama, *Kagaku to Kogyo (Tokyo)* **1988**, *41*, 1163.
   c) H. Sawada, M. Nakayama, *Yukagaku* **1989**, *38*, 103.
   d) M. Nakano, H. Kimura, *Rinsho Kensa* **1989**, *33*, 256.
   e) K. Imai, in *Bioluminescence and Chemiluminescence*, Hirokawa Publishing, **1989**.
   f) H. Sawada, K. Masuyama, M. Nakayama, *Yukagaku* **1990**, *39*, 47.
   g) M. Nakano, *Methods Enzymol*. **1990**, *186*, 227.
   h) M. Nakano, *Methods Enzymol*. **1990**, *186*, 585.
4) CLA, MCLA, FCLA
   a) N. Suzuki, K. Suetsuna, S. Mashiko, T. Nomoto, Y. Toya, B. Yoda, H. Inaba, *Chem. Express* **1990**, *5*, 537.
   b) N. Suzuki, K. Suetsuna, S. Mashiko, B. Yoda, T. Nomoto, Y. Toya, H. Inaba, T. Goto, *Agric. Biol. Chem*. **1991**, *55*, 157.
5) Red-CLA
   a) K. Teranishi, Tokyo Kasei Kogyo Co., Ltd., JP Patent 4453528.
   b) K. Teranishi, *Luminescence* **2007**, *22*, 147.
6) Firefly luciferase
   a) A. Lundin, *Methods Enzymol*. **2000**, *305*, 346.
   b) J. J. Lemasters, C. R. Hackenbrock, *Methods Enzymol*. **1979**, *56*, 530.

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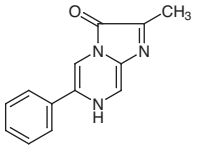
Chemiluminescence Compounds

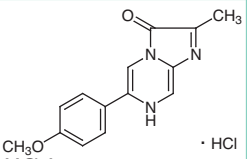
Cypridina Luciferin Analogs

A5307 10mg



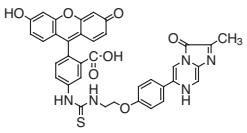
CLA
CAS RN: 19953-58-3

A5309 10mg



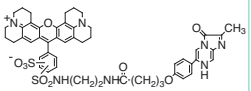
MCLA
CAS RN: 128322-44-1

A5310 10mg



FCLA Free Acid
CAS RN: 133118-06-6

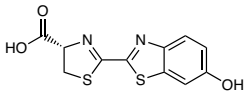
A5311 1mg



Red-CLA
CAS RN: 886840-56-8

Firefly Luciferin

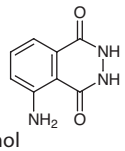
A5030 10mg 50mg



D-(-)-Luciferin
CAS RN: 2591-17-5

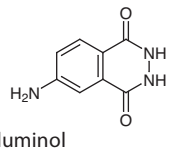
Luminols

A5301 1g 25g



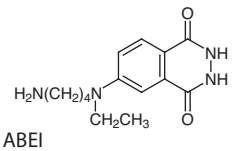
Luminol
CAS RN: 521-31-3

A5300 1g 10g



Isoluminol
CAS RN: 3682-14-2

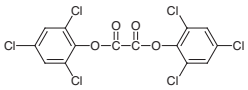
A5304 100mg 1g



ABEI
CAS RN: 66612-29-1

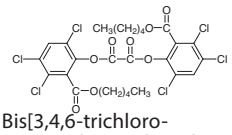
Oxalates

A5302 1g 5g



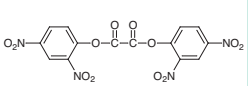
TCPO
CAS RN: 1165-91-9

O0236 5g 25g



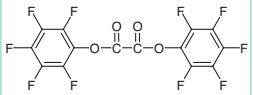
Bis[3,4,6-trichloro-2-(pentyloxycarbonyl)-phenyl] Oxalate
CAS RN: 30431-54-0

A5303 1g 5g



DNPO
CAS RN: 16536-30-4

A5305 1g



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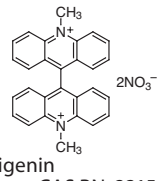
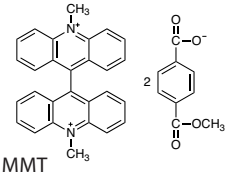
Acridinium Salts

B1203 1g 5g



Lucigenin
CAS RN: 2315-97-1

B4339 100mg 1g



MMT
CAS RN: 469865-01-8

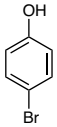
Chemiluminescence Enhancers

S0887 25g 500g

$NaBO_3 \cdot 4H_2O$

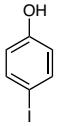
Sodium Perborate Tetrahydrate
CAS RN: 10486-00-7

B3910 1g 5g



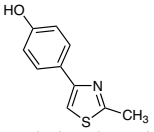
4-Bromophenol
CAS RN: 106-41-2

I0840 1g 5g



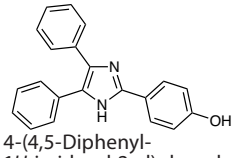
4-Iodophenol
CAS RN: 540-38-5

M2325 100mg 1g



4-(2-Methyl-4-thiazolyl)-phenol
CAS RN: 30686-73-8

D4178 100mg



4-(4,5-Diphenyl-1*H*-imidazol-2-yl)phenol
CAS RN: 1752-94-9

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