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Product Information

Mag-Fluo-4

Product List

Catalog no.	Product	Unit size	Storage Temperature
50047	Mag-Fluo-4, Tetrapotassium Salt	500 ug	4°C
50048	Mag-Fluo-4, AM Ester	10 x 50 ug	-20°C

Molecular Information:

Product	MW	Formula	Solubility
Mag-Fluo-4, Tetrapotassium Salt	682	C ₂₅ H ₁₃ F ₂ K ₄ NO ₁₀	Soluble in water
Mag-Fluo-4, AM Ester	818	C ₃₇ H ₃₃ F ₂ NO ₁₈	Soluble in DMSO

Color and Form: Orange solid

Absorption/Emission: 493/517 nm (high Mg²⁺) (after hydrolysis for AM ester)

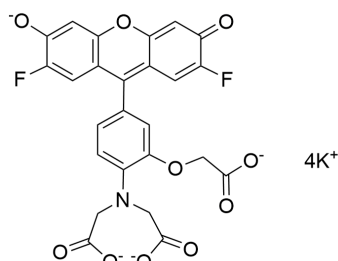


Figure 1. Mag-fluo-4 tetrapotassium salt

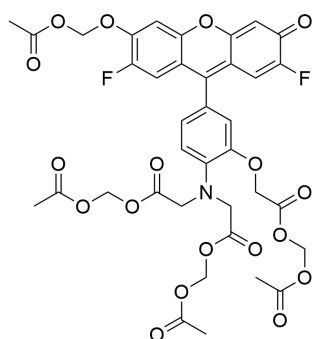


Figure 2. Mag-fluo-4, AM ester

Storage and Handling

Stock solutions of Mag-Fluo-4, Tetrapotassium Salt (50047) may be prepared in water and stored at 4°C or -20°C, protected from light, for at least 12 months.

Stock solutions of Mag-Fluo-4, AM Ester (50048) should be prepared in anhydrous DMSO. Solutions can be aliquoted and stored desiccated and protected from light at -20°C for up to 12 months.

Product Description

Mag-Fluo-4 is a fluorescent ion indicator and is an analog of Fluo-4. The indicator has an affinity for magnesium (K_d = 4.7 mM) and low affinity for calcium (K_d = 22 μM) with absorbance/emission at 493/517 nm (high Mg²⁺). We offer Mag-Fluo-4 as a cell-permeant AM ester form (50048), or as a membrane-impermeant tetrapotassium salt (50047). The membrane-impermeant tetrapotassium salt can be introduced into cells by microinjection, while the AM ester can be loaded into cells by incubation.

References

1) Biophys J. 97(7). 1864(2009); 2) Biochem J. 367(1). 137(2002); 3) Biochimica et Biophys Acta - Mol Cell Res. 1864(6). 977(2017); 4) Biochem & Biophys Res Comm. 454(4). 572(2014); 5) J. Biol. Chem. 264, 8171(1989); 6) J. Biol. Chem. 264, 8179(1989); 7) Meth. Enzymol. 192, 38 (1990); 8) A Practical Guide to the Study of Calcium in Living Cells, Volume 40. San Diego: Academic Press, 1994.

Protocol for cell loading of AM esters

The following is an example protocol for loading cells with AM esters of ion indicator dyes (8). You may need to optimize the buffer system or concentration of ion indicator dye for your experimental system. The use of Pluronic® F-127 (see Related Products), a non-ionic detergent that facilitates AM ester solubilization, is optional.

1. Prepare a 1-5 mM stock solution of the AM ester using anhydrous DMSO.
2. Mix 1 μL 20% Pluronic® F-127 in DMSO with 1 μL of ion indicator stock solution in DMSO.
3. Add 1 mL Krebs-Ringer-HEPES-glucose buffer (KRH-glc) containing 0.5% bovine serum albumin (BSA) to the tube containing Pluronic® and dye AM ester and mix well for a final concentration of 1-5 μM.

KRH-glc: 136 mM NaCl, 10 mM HEPES, 4.7 mM KCl, 1.25 mM MgSO₄, 1.25 mM CaCl₂, 25 mM glucose, pH 7.4.

Note: The final concentration of the dye should be as low as possible in order to minimize background fluorescence and nonspecific staining.

4. Wash cells twice with KRH-glc + 0.5% BSA.
5. Add the AM ester solution from step 3 to cells and incubate 30 minutes, protected from light.

Note: Incubating cells at 37°C promotes dye compartmentalization in organelles, particularly mitochondria. For measuring cytoplasmic ion it is recommended to incubate cells at room temperature to reduce dye compartmentalization.

6. Rinse cells several times with KRH-glc + 0.5% BSA.

Considerations for measuring cellular ion concentrations

Fluorescent magnesium indicators are used in similar applications as calcium indicator dyes. The K_d of any indicator dye usually is affected by a number of factors in cells including pH, proteins concentrations, ionic strength, temperature and viscosity. Thus, calibration of the K_d is necessary for accurate measurement of intracellular ion concentrations. For literature with detailed information on loading, calibrating, and imaging indicator dyes, please see References.

We also offer the chelator TPEN, which can be used to remove heavy metals from buffers for indicator calibration, and EDC (also known as EDAC), which can be used to fix ion indicators in cells, if histochemical studies will be performed following physiological experiments. See Related Products, or visit www.biotium.com to see our full selection of ion indicator dyes and related reagents.

Related Products

Catalog number	Product
90082	DMSO, Anhydrous, 10 mL
50000	BAPTA, AM Ester
50001	BAPTA, Tetracesium Salt
50002	BAPTA, Tetrapotassium Salt
50003	BAPTA, Tetrasodium Salt
50019	Fluo-4, Pentapotassium Salt
50018	Fluo-4 AM Ester
50013	Fluo-3, AM Ester
50033	Fura-2, AM Ester
50030	Fura-2, Pentaammonium Salt
50031	Fura-2 Pentapotassium Salt
50032	Fura-2, Pentasodium
50043	Indo-1, AM Ester
50040	Indo-1, Pentaammonium
50041	Indo-1, Pentapotassium Salt
50042	Indo-1, Pentasodium
50023	Rhod 2, AM Ester
50020	Rhod-2, Triammonium Salt
50021	Rhod-2, Tripotassium Salt
50022	Rhod-2, Trisodium Salt
50025	Rhod-590 AM Ester
50026	Rhod-590, Tripotassium Salt
50037	Furaptra (Mag-Fura-2), AM Ester
50035	Furaptra (Mag-Fura-2), Tetrapotassium Salt
50036	Furaptra (Mag-Fura-2), Tetrasodium Salt
59003	TPEN (Tetrakis-(2-pyridylmethyl)ethylenediamine)
59100	Calcium Calibration Buffer Kit
59004	Pluronic® F-127 20% Solution in DMSO

Please visit our website at www.biotium.com for information on our life science research products, including live cell stains for nuclei, mitochondria, and other organelles, apoptosis probes, viability stains, and labeled antibodies and other conjugates for cell biology research.

Pluronic F-127 is a registered trademark of BASF.

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