Fluo-4, pentapotassium salt

Fluo-4, pentapotassium is membrane-impermeant calcium indicator. It can be loaded into cells via microinjection or scrape loading.

Product attributes

Cell permeability	Membrane impermeant
Indicator type	Non-ratiometric
Excitation/Emission	494/516 nm

Product Description

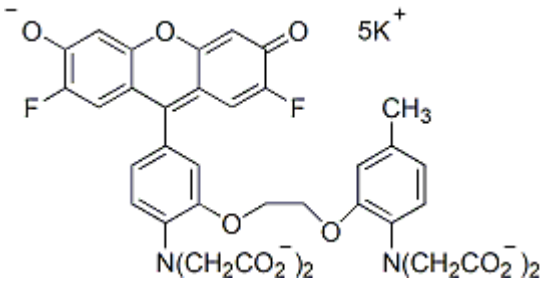
Fluo-4 is an analog of Fluo-3 with the two chlorine substituents replaced by fluorines, which results in increased fluorescence excitation at 488 nm that gives higher fluorescence signal. Fluo-4 has its absorption maximum at 494 nm, thus making it excitable by the argon-ion laser. Fluo-4 is essentially nonfluorescent without Ca^{2+} present, but the fluorescence increases at least 100 times on Ca^{2+} binding. Also, because Fluo-4 binds Ca^{2+} more weakly (higher K_d) than do fura-2 and indo-1, it is more useful for measuring high transient Ca^{2+} concentration during Ca^{2+} spikes. Fluo-4, pentapotassium is membrane-impermeant, but can be loaded into cells via microinjection or scrape loading.

BAPTA-based ion indicators like Fluo-4 have been shown to be fixable in situ by EDC/EDAC (cat# 59002). The fixation of indicator dyes is useful for downstream immunofluorescence and IHC studies (Cell Calcium 1997, 21(3), 175).

As the indicator does not covalently bind to cellular components, it may be actively effluxed from the cell by organic anion transporters. The rate of efflux increases with temperature, and may vary between cell types, resulting in variable retention times of a few minutes to hours. Experiments using indicators in cells usually are performed within one or two hours of loading, but it may be possible to re-load cells with indicator if needed. The organic anion transporter inhibitor Probenecid (#50027) can be used to slow the rate of indicator efflux from cells.

We also offer a membrane-permeant version, Fluo-4 AM Ester (catalog number cat# 50018).

- K_d: ~335 nM
- $\lambda_{Ex}/\lambda_{Em}$ (low or high [Ca^{2+}]) = 494/516 nm
- ε (494 nm) = 82,000 M^{-1} cm^{-1}
- Orange solid soluble in DMSO and water (pH >6)
- Store at 4 °C. Protect from light, especially when in solution
- $C_{36}H_{25}F_2K_5N_2O_{13}$
- MW: 927.09



References

1. Cell Calcium 27, 97, (2021), DOI: 10.1054/ceca.1999.0095
2. Methods Cell Biol, 99, 113, (2021), DOI: 10.1016/B978-0-12-374841-6.00005-0