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Revised: 2011-05-16

Product Information: ATTO Thio12

ATTO Thio12 is a new label closely related to the well-known rhodamines. The dye can be used for labeling of DNA, RNA or proteins. The characteristic feature of the label is **high yield of triplet formation**.

The dye is moderately hydrophilic. **ATTO Thio12** is a cationic dye. After coupling to a substrate the dye carries a net electrical charge of +1. For details of coupling see our recommended labeling procedure at www.atto-tec.com - Support - Downloads - [General Procedures](#).

Optical data of the carboxy derivative (in water):

$$\lambda_{\text{abs}} = 579 \text{ nm}$$

$$\epsilon_{\text{max}} = 1.1 \times 10^5 \text{ M}^{-1} \text{ cm}^{-1}$$

$$\lambda_{\text{fl}} = 609 \text{ nm}$$

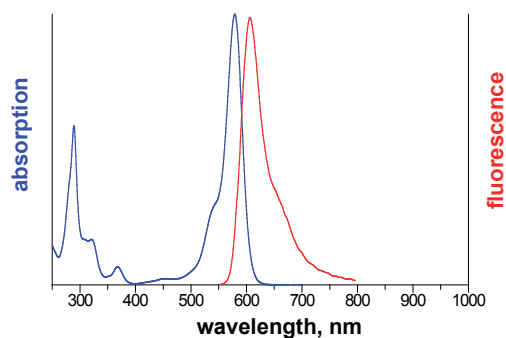
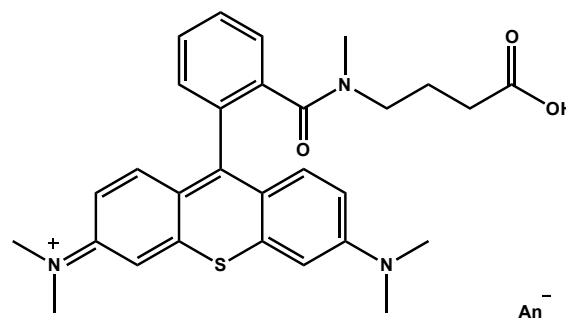
$$\eta_{\text{fl}} = 15 \%$$

$$\eta_{\text{t}} = 20 \%$$

$$\tau_{\text{fl}} = 2.0 \text{ ns}$$

$$\text{CF}_{260} = 0.10$$

$$\text{CF}_{280} = 0.37$$



Spectra available in digitized form (excel file) on <http://www.atto-tec.com>

Modification	MW, g/mol	M ⁺ , g/mol	Order Code	
			Unit (1 mg)	Unit (5 mg)
with free COOH	602	502	AD Thio12-21	AD Thio12-25
NHS-ester	699	600	AD Thio12-31	AD Thio12-35
maleimide	724	624	AD Thio12-41	AD Thio12-45
biotin	925	812	AD Thio12-71	AD Thio12-75

General Information

Storage: The product is shipped solvent-free at ambient temperature. Upon receipt store at -20 °C. To avoid moisture condensation onto the product, vial must be equilibrated to room temperature before opening. When stored properly, protected from moisture and light, ATTO-TEC products are stable for at least three years.

Risk and safety: A material safety data sheet (MSDS) of each derivative can be downloaded from our website at www.atto-tec.com.

Solutions: The product is soluble in polar solvents, e.g. dimethylformamide (DMF), dimethylsulfoxide (DMSO), or acetonitrile. However, due to their inherent reactivity, NHS-esters and maleimides must be well protected from OH-containing solvents like ethanol and, in particular, water. Prepare labeling solutions of NHS-esters and maleimides immediately before use by dissolving the vial content in anhydrous and amine-free DMF or DMSO. Depending on the quality of the solvent used, such solutions may be of limited stability.

Dye with **free COOH** may be used for any kind of spectroscopy. Due to the high extinction coefficient and its high quantum yield of fluorescence this product is suitable for high-sensitivity detection including single-molecule work. The dye can be activated at the carboxy group for coupling purposes.

The **NHS-ester** of the dye reacts easily with amino-groups of proteins and other bio-molecules. Since the amino-group must be non-protonated to be reactive, the pH of the reaction solution has to be adjusted sufficiently high. As with all NHS-esters unavoidable hydrolysis takes place at high pH and competes with the desired labeling. Therefore the solution has to be buffered carefully. For details see the Labeling Protocol on www.atto-tec.com.

The **maleimide** is suitable for labeling sulfhydryl (thiol) groups of proteins, in particular cystein residues. See Labeling Protocol on www.atto-tec.com.

The **biotin** derivative can be used as reagent for binding to proteins like avidin and streptavidin.

Further Notes:

- ATTO-TEC products are high-quality reagents intended for research purposes only.
- The use of ATTO-TEC products must be supervised by technically qualified personnel experienced in handling potentially hazardous chemicals. For safety instructions please read the corresponding Material Safety Data Sheet.
- Most ATTO-TEC products and product applications are covered by European and foreign patents.
- Commercial use of ATTO-TEC products is not permitted without written agreement by ATTO-TEC GmbH. Inquiries for licensing may be directed to info@atto-tec.com.