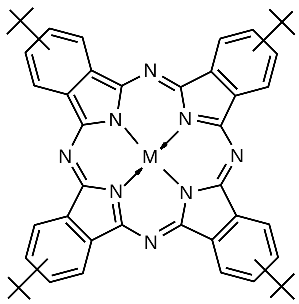
Functional Dyes

Near-Infrared Absorbers

During the past few years, we have introduced several new groups of functional dyes[1,2] including infrared absorbers,[3,4] materials for nonlinear optics, soluble phthalo- and naphthalocyanines, and laser dyes.[5] These materials have been used by high-tech companies and research laboratories for developing new, unconventional technologies[6] such as optical recording, thermal writing, and laser printing.

Recently, we have concentrated our efforts on two groups of near-infrared absorbers that absorb in the 670-810nm region. One absorber group includes highly photoresistant tetra-*tert*-butylphthalo- and -naphthalocyanines; the second group includes photolabile carbocyanine dyes. Both groups of materials have very intense, narrow absorption bands with E values exceeding 200,000. These two complementary classes allow the user to cover a wide spectrum of applications.

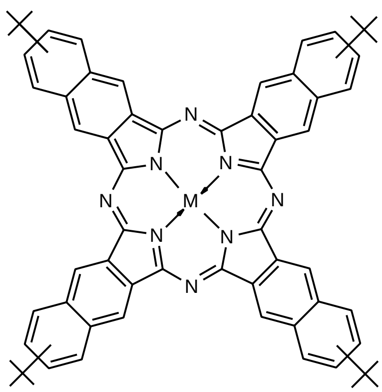


M = Zn, $SiCl_2$, Cu

43,099-4 Zinc 2,9,16,23-tetra-*tert*-butyl-29*H*,31*H*-phthalocyanine, λ_{max} = 677nm

43,218-0 Silicon 2,9,16,23-tetra-*tert*-butyl-29*H*,31*H*-phthalocyanine dichloride, λ_{max} = 672nm

42,316-5 Copper(II) 2,9,16,23-tetra-*tert*-butyl-29*H*,31*H*-phthalocyanine, λ_{max} = 672nm



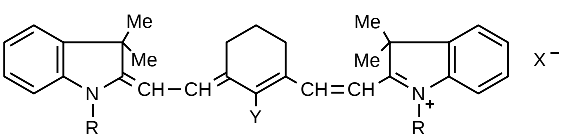
M = VO, Ni, Zn

43,296-2 Vanadyl 2,11,20,29-tetra-*tert*-butyl-2,3-naphthalocyanine, λ_{max} = 808nm

43,295-4 Nickel(II) 2,11,20,29-tetra-*tert*-butyl-2,3-naphthalocyanine, λ_{max} = 766nm

43,221-0 Zinc 2,11,20,29-tetra-*tert*-butyl-2,3-naphthalocyanine, λ_{max} = 769nm

42,527-3 2,11,20,29-Tetra-*tert*-butyl-2,3-naphthalocyanine, λ_{max} = 784nm



42,531-1 IR-780 iodide, R = Pr ; X^- = I^-; Y = Cl**;** λ_{max} = 780nm

42,413-7 IR-786 iodide, R = Me; X^- = I^-; Y = Cl**;** λ_{max} = 775nm

42,530-3 IR-780 perchlorate, R = Pr; X^- = ClO_4^-; Y = Cl**;** λ_{max} = 780nm

40,711-9 IR-786 perchlorate, R = Me; X^- = ClO_4^-; Y = Cl; λ_{max} = 775nm

42,598-2 IR-792 perchlorate, R = Pr; X^- = ClO_4^- ; Y = SPh**;** λ_{max} = 792nm

42,745-4 IR-768 perchlorate, R = Pr; X^- = ClO_4^- ; Y = OPh; λ_{max} = 768nm

References: (1) Zollinger, H. *Color Chemistry: Syntheses, Properties and Applications of Organic Dyes and Pigments,* 2nd rev. ed.; VCH: Weinheim, Germany, 1991. (Aldrich Cat. No. **Z23,335-8**) (2) *Phthalocyanines, Properties and Applications*; Leznoff, C.C.; Lever, A.B.P., Eds.; VCH: New York, 1993. (3) *Infrared Absorbing Dyes*; Matsuoka, M., Ed.; Plenum: New York, 1990. (Aldrich Cat. No. **Z23,583-0**) (4) Fabian, J. et al. *Chem. Rev.* **1992**, *92*, 1197. (5) Luk'yanetz, E.A. *Mol. Mat.* **1992**, *1*, 15. (6) *Nonlinear Optical Properties of Organic Molecules and Crystals*; Chemla, D.S.; Zyss, J., Eds.; Academic: Orlando, 1987, Vol. 1 and 2.

A Related Product

42,815-9 Silicon(IV) phthalocyanine bis(trihexylsilyloxide), λ_{max} = 669nm