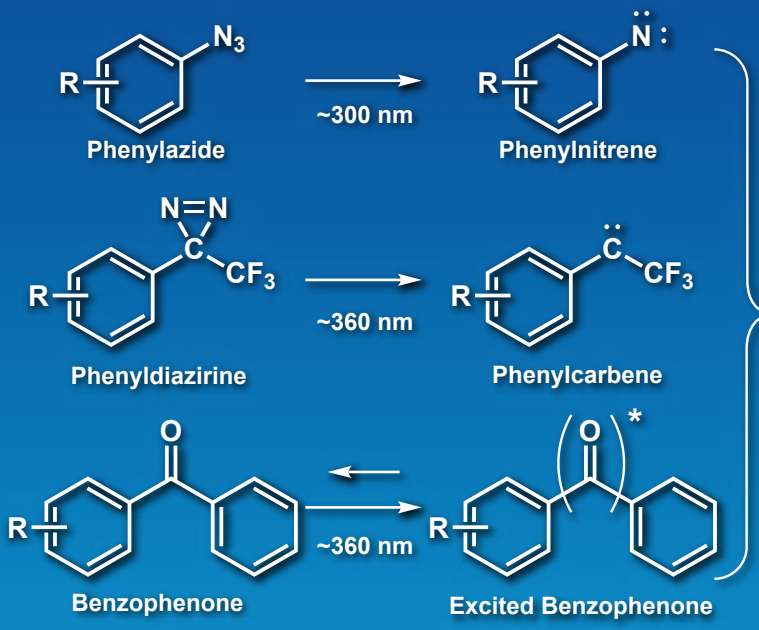
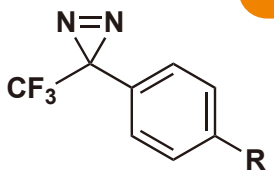
Photo-reactive Crosslinkers



Some functional groups can be induced to react with target molecules by exposure to UV light. Photoreactive groups such as azides and diazirines are readily decomposed by UV light irradiation, resulting in highly reactive intermediates and the formation of covalent bonds with neighboring molecules. Within the context of molecular biology, photoaffinity labeling has prolific use in preparing ligands with photo-reactive units enabling the direct probing of target proteins.

Phenyldiazirines



R = CH_2OH	[T2818]
CH_2Br	[T2819]
COOH	[T2820]
$CH_2NH_2 \cdot HCl$	[T3448]

Phenyldiazirine generates a carbene unit by UV irradiation (<360 nm). Phenylcarbene can crosslink by short-time irradiation due to higher reactivity than nitrenes. Phenylcarbene is inactivated by water when neighboring target molecules are absent, and thus does not lead to non-specific crosslinking.

Applications

Reviews

T. Tomohiro, M. Hashimoto, Y. Hatanaka, *Chem. Record* **2005**, *5*, 385.
M. Hashimoto, Y. Hatanaka, *Eur. J. Org. Chem.* **2008**, 2513.

Photoaffinity labeling

Y. Kashiwayama, T. Tomohiro, K. Narita, M. Suzumura, T. Glumoff, J. K. Hiltunen, P. P. V. Veldhoven, Y. Hatanaka, T. Imanaka, *J. Biol. Chem.* **2010**, *285*, 26315.
E. W. S. Chan, S. Chattopadhaya, R. C. Panicker, X. Huang, S. Q. Yao, *J. Am. Chem. Soc.* **2004**, *126*, 14435.
K. Matsuda, M. Ihara, K. Nishimura, D. B. Sattelle, K. Komai, *Biosci. Biotechnol. Biochem.* **2001**, *65*, 1534.
M. Wiegand, T. K. Lindhorst, *Eur. J. Org. Chem.* **2006**, 4841.

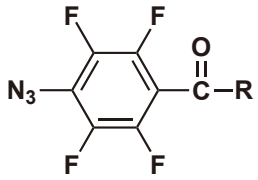
Photoaffinity microarray

D. M. Dankbar, G. Gauglitz, *Anal. Bioanal. Chem.* **2006**, *386*, 1967.
S. Wei, J. Wang, D.-J. Guo, Y.-Q. Chen, S.-J. Xiao, *Chem. Lett.* **2006**, *35*, 1172.
N. Kanoh, S. Kumashiro, S. Simizu, Y. Kondoh, S. Hatakeyama, H. Tashiro, H. Osada, *Angew. Chem. Int. Ed.* **2003**, *42*, 5584.

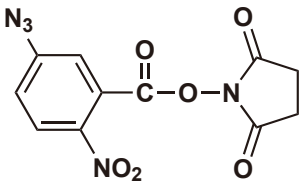
4-[3-(Trifluoromethyl)-3*H*-diazirin-3-yl]benzyl Alcohol	200mg / 1g [T2818]
4-[3-(Trifluoromethyl)-3*H*-diazirin-3-yl]benzyl Bromide	200mg / 1g [T2819]
4-[3-(Trifluoromethyl)-3*H*-diazirin-3-yl]benzoic Acid	200mg / 1g [T2820]
4-[3-(Trifluoromethyl)-3*H*-diazirin-3-yl]benzylamine Hydrochloride	200mg / 1g [T3448]

Phenylazides

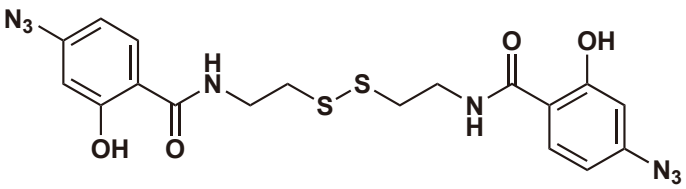
Phenylazide generates a nitrene by UV irradiation (<300 nm). It is noted that azido groups tend to have less harmful effect on target analyte. Activation of the nitrene requires a shorter wavelength of UV light, and potential protein denaturation during long-period irradiation should be taken into consideration.



R = OH [A2674]
NHS [S0952]



[S0860]



[B3790]

Applications

Photoaffinity labeling
J. F. W. Keana, S. Xiong Cai, *J. Org. Chem.* **1990**, *55*, 3640.

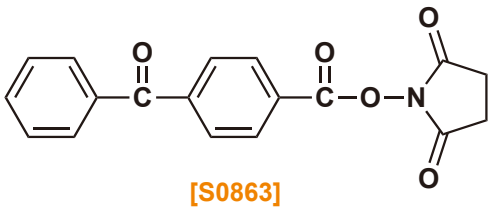
Photoaffinity microarray
M. Thust, M. J. Schöning, J. Vetter, P. Kordos, H. Lüth, *Anal. Chim. Acta* **1996**, *323*, 115.

Photo-crosslinking of protein complex
J. Rappsilber, S. Siniossoglou, E. C. Hurt, M. Mann, *Anal. Chem.* **2000**, *72*, 267.

Photo-modification of carbon nanotube suface
S. J. Pastine, D. Okawa, B. Kessler, M. Rolandi, M. Llorente, A. Zettl, J. M. J. Fréchet, *J. Am. Chem. Soc.* **2008**, *130*, 4238.

4-Azido-2,3,5,6-tetrafluorobenzoic Acid	1g [A2674]
4-Azido-2,3,5,6-tetrafluorobenzoic Acid *N*-Succinimidyl Ester	200mg / 1g [S0952]
5-Azido-2-nitrobenzoic Acid *N*-Succinimidyl Ester	10mg [S0860]
Bis[2-(4-azidosalicylamido)ethyl] Disulfide	10mg [B3790]

Benzophenone



[S0863]

Benzophenone excited by UV irradiation (near 360 nm) to induce hydrogen abstraction from target molecules. The reaction efficiency remains high despite this due to the reverseability of the excited state. Additionally, photoexcited benzophenone is not water-reactive.

Applications

Photoaffinity labeling
G. F. Ross, P. M. Smith, A. McGregor, D. M. Turnbull, R. N. Lightowlers, *Bioconjugate Chem.* **2003**, *14*, 962.
Y. Jung, J. M. Lee, J.-w. Kim, J. Yoon, H. Cho, B. H. Chung, *Anal. Chem.* **2009**, *81*, 936.

Photoaffinity microarray
A. J. Hughes, A. E. Herr, *Proc. Natl. Acad. Sci. USA*, **2012**, *109*, 21450.

4-Benzoylbenzoic Acid *N*-Succinimidyl Ester	200mg / 1g [S0863]

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