

[Chem. Pharm. Bull., 46, 913-917 (1998)]

[Lab. of Pharm. Chemistry]

**Photochemical [3+2] Cycloaddition of 2'-Vinyl-2*H*-1,4-benzothiazin-3(4*H*)-one-2-spirocyclopropanes Catalyzed by Diphenyl Dichalcogenides.**

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2'-Vinyl-2*H*-1,4-benzothiazin-3(4*H*)-one-2-spirocyclopropanes were irradiated with a tungsten lamp at room temperature in the presence of a catalytic amount of diphenyl dichalcogenides to provide 1,2-dioxolane derivatives in good yields. Diphenyl diselenide was more effective than diphenyl disulfide as a radical source. The photochemical [3+2] cycloaddition with electron-deficient alkenes proceeded smoothly under reflux in benzene to give spiro-cyclopentanes. Spiro-cyclopentenes were formed by the photochemical [3+2] cycloaddition with electron-deficient alkynes.

[Chem. Pharm. Bull., 46, 1039-1043 (1998)]

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**Serotonin 5-HT<sub>4</sub> Receptor Agonistic Activity of the Optical Isomers of (±)-4-Amino-*N*-[2-(1-azabicyclo[3.3.0]octan-5-yl)ethyl]-5-chloro-2,3-dihydro-2-methylbenzo[*b*]furan-7-carboxamide.**

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The enantiomers, (R)-(-)-1 and (S)-(+)-1, of 4-amino-*N*-[2-(1-azabicyclo[3.3.0]octan-5-yl)ethyl]-5-chloro-2,3-dihydro-2-methylbenzo[*b*]furan-7-carboxamide were prepared from optically active benzyl 4-acetylamino-2,3-dihydro-2-methylbenzo[*b*]furan-7-carboxylate [(R)-(+)-2, (S)-(-)-2], respectively. The absolute configuration of (S)-(+)-1 was determined by single crystal X-ray analysis. The serotonin 5-HT<sub>4</sub> receptor agonistic activity of (S)-(-)-1 hemifumarate (SK-951) was about twice that of the other enantiomer (R)-(+)-1 hemifumarate.

[Chem. Pharm. Bull., 46, 1265-1273 (1998)]

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**Synthesis and Muscarinic Activity of a Series of Quinolines and Naphthalenes with a 1-Azabicyclo[3.3.0]octane Moiety.**

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In order to discover a medicine effective against Alzheimer's disease, we synthesized a series of quinoline derivatives having a characteristic 1-azabicyclo[3.3.0]octane amine ring, and performed pharmacological evaluation of them. Tests for central nervous muscarinic cholinergic receptor binding affinity indicated that these compounds had higher affinities to muscarinic M<sub>1</sub> receptors than to M<sub>2</sub> receptors. A series of naphthalene derivatives substituted with the 1-azabicyclo[3.3.0]octane ring were also synthesized and muscarinic M<sub>1</sub> and M<sub>2</sub> receptor binding affinity determined. These compounds had much higher affinity for M<sub>1</sub> receptors than the quinoline derivatives, and 1-[*N*-(1-azabicyclo[3.3.0]octan-5-yl)methyl-*N*-methylamino]-4-nitronaphthalene showed the highest affinity and selectivity.

[Synthesis, 423-426 (1998)]

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**Preparation of Sulfonamides from Sodium Sulfonates: Ph<sub>3</sub>P•Br<sub>2</sub> and Ph<sub>3</sub>P•Cl<sub>2</sub> as a Mild Halogenating Reagent for Sulfonyl Bromides and Sulfonyl Chlorides.**

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Aryl- and alkyl-sulfonamides were prepared by treatment of the corresponding sodium sulfonates with triphenylphosphine dibromide or dichloride followed by amines in the presence of triethylamine *via* sulfonyl halides. Reactions of sodium aminosulfonates gave cyclized products. Amidation of *p*-toluenesulfonic acid with triphenylphosphine dichloride was also examined to give *N*-benzyl-*p*-toluenesulfonamide. Methyl *p*-toluenesulfonate was obtained by esterification of sodium *p*-toluenesulfonate *via* *p*-toluenesulfonyl chloride.