



MUSCLE RELAXANT DRUGS (Myerolaxant Drugs)

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- The centrally acting muscle relaxants tend to depress the central nervous system by keeping the muscle tonus under control.
- The exact mechanism of action of skeletal muscle relaxants is not well known at this time.
- The use of these drugs may result in a mild general sedative effect producing an overall relaxation.
- Have an onset of action between 30 and 60 minutes
- Duration of action varies among the drugs
- 1910-Discovery of phenoxypropanediol
- 1946-Berger and Bradly, incidentally found that mephenesine blocked the nerve conduction in spinal medullary
- 1949-Goodmer's found that the benzimidazole structure also have a myorelaxant activity



Classification

- 1) Propanediol Derivatives
- 2) Benzoxazole Derivatives
- 3) Benzodiazepines
- 4) Baclofen
- 5) Other medicines

Propanediol Derivatives

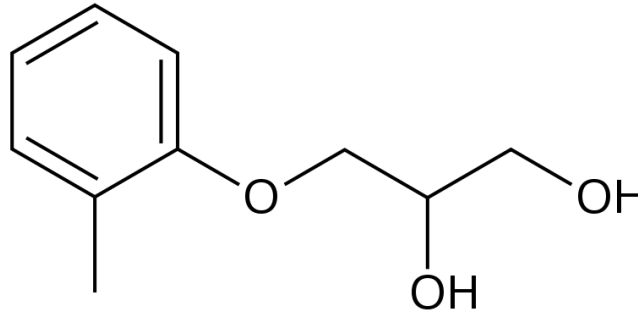
-They are monoaryloxyglycerol and their carbamates that are formed by glycerin and phenol.

-They cause sedation due to the depressive effects on the CNS, and they also have partial tranquillizer effects.



Mephenesin

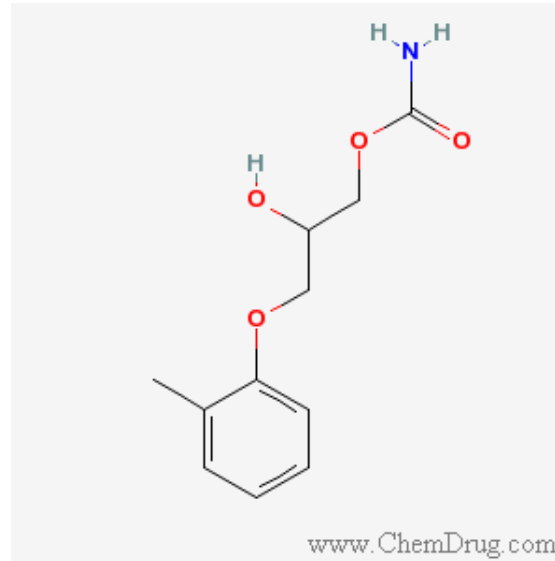
Inflazone, Relaxar, Decontractyl



3-(2-Methylphenoxy)-1,2-propanediol

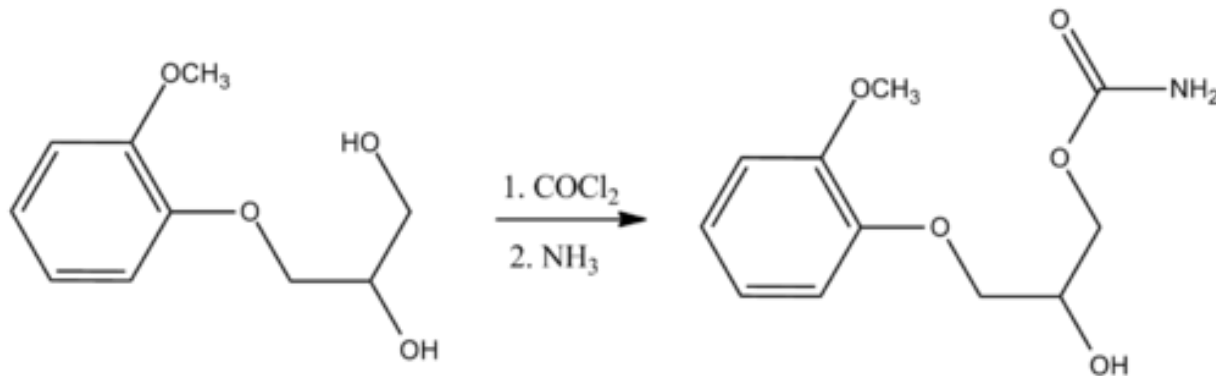
- The prototype for this group of drugs and the first drug used in treatment.
- Impact duration is very short and side effects are too high
- Synthesis: Reaction of 2-methylphenol with 3-chloropropane-1,2-diol in basic medium (NaOH)
- Absorbed by the gastrointestinal tract when taken orally
- Metabolism in liver

Mephenesine carbamate

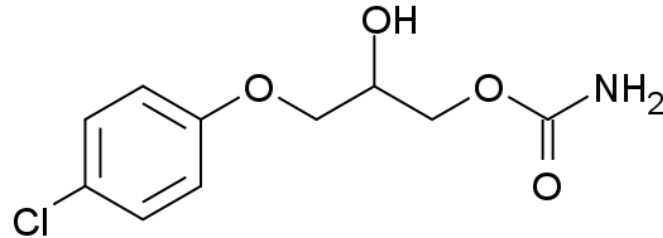


3-(2-Methylphenoxy)-1,2-propanediol carbamate

- Slower absorption and biotransformation than mephenesin

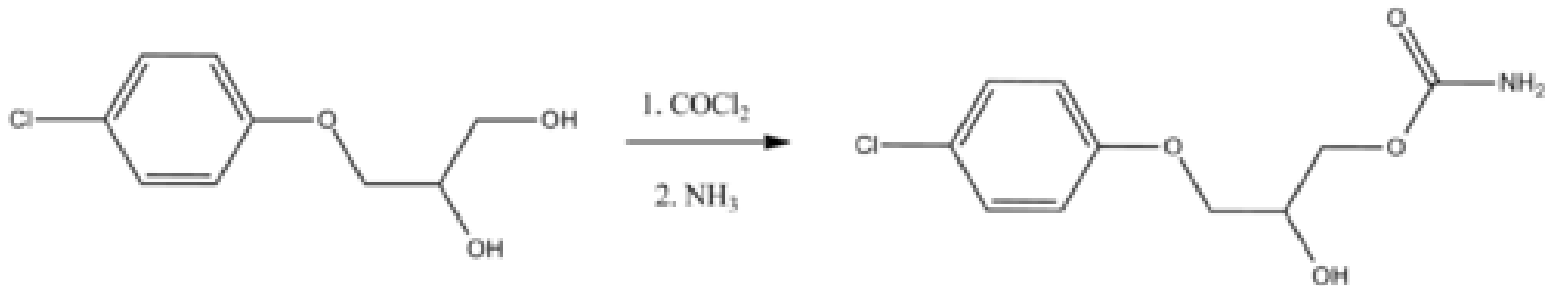


Chlorfenesine carbamate Rinlaxer



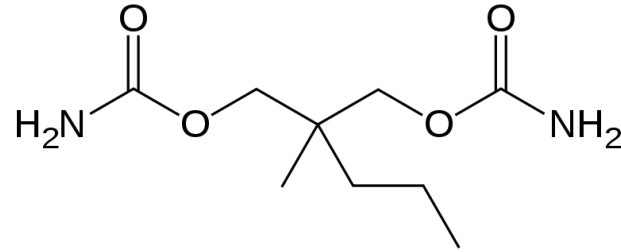
3-(4-chlorophenoxy)-1,2-propanediol carbamate

- The duration of action is longer than that of mephenesine
- Side effects; mouth instability, numbness, dizziness, insomnia and nausea



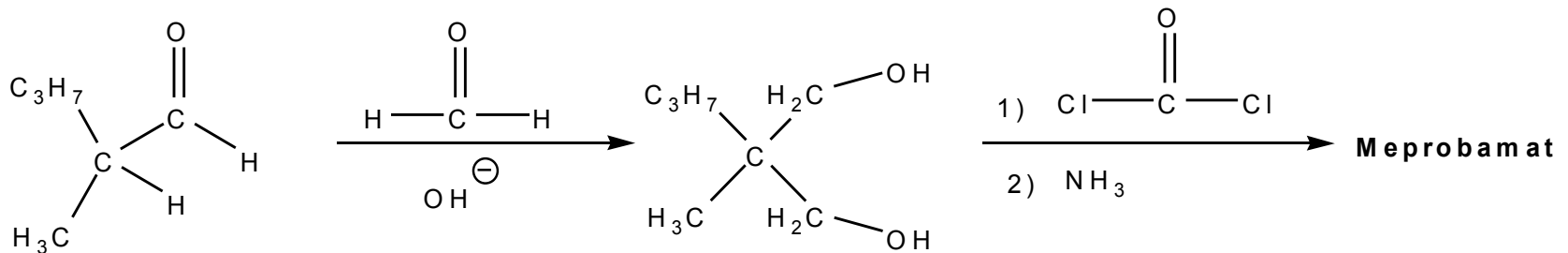


Meprobamate Danitrin Forte



2-Methyl-2-propylpropane-1,3-diol dicarbamate

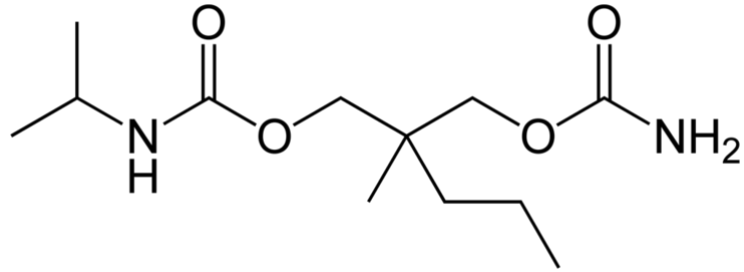
- There is muscle relaxant effect besides tranquillizer effect
- Metabolism by microsomal enzymes in the liver
- Oxidation of the propyl side chain takes place in the form of hydroxy meprobamate and glucuronic acid conjugates



2-Metil valeril aldehit



Carisoprodol: Soma, Carisoma

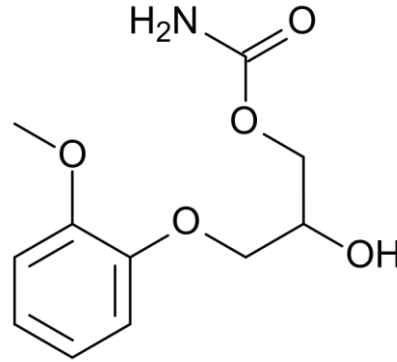


N-Isopropyl-2-methyl-2-propylpropane-1,3-diol dicarbamate

- Muscle relaxant that works by blocking the pain sensations from the nerves by acting on the central nervous system.
- It is used to temporarily relieve pain from muscle pain and spasms.
- Metabolism by microsomal enzymes in the liver



Methacarbamol Miyoreks, Myorel

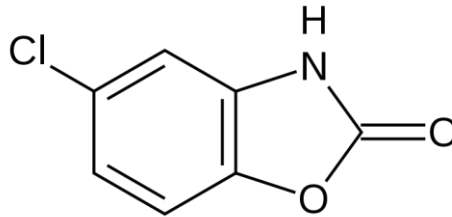


3-(2-Methoxyphenoxy)-1,2-propanediol carbamate

- Methacarbamol: a central muscle relaxant used to treat skeletal spasm and helps to relax muscles and reduce muscle pains associated from spasms and muscle stress.
- Side effects; numbness, dizziness, nausea, allergic symptoms

Benzoxazole Derivatives

Chlorzoxazone: Paraflex, Parafon, Mepadol, Muskazon

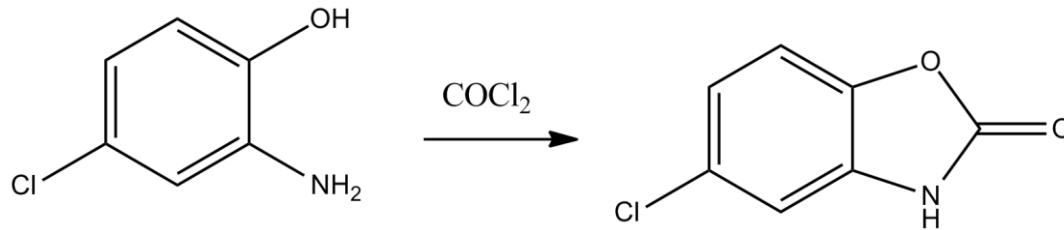


5-Chloro-2-benzoxazolinone

It is used with aspirin or other analgesic drugs against muscle spasms

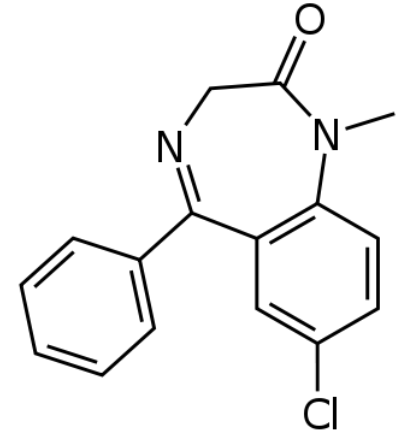
Elimination from the body is fast, so the duration of action is short

hepatotoxic

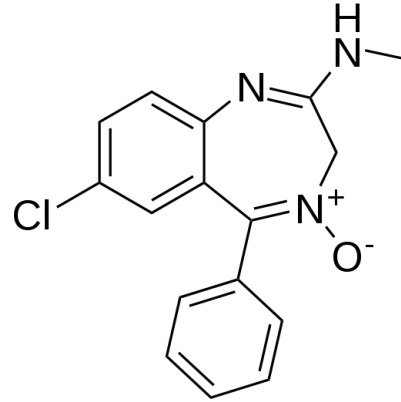


Benzodiazepines

- Sedative and hypnotic drugs
- Tranquilizing effect
- **Diazepam** Diapam, Diazem, Lizan, Nervium
- 7-Chloro-1,3-dihydro-1-methyl-5-phenyl-2H-1,4-benzodiazepin-2-one
- aside from relieving muscle pains and spasms, it also alleviates convulsion, and anxiety related symptoms. It acts on the brain and nerves and produced a temporary calming effect on the user
- Side effects: Sedation and numbness



Chlordiazepoxide Librax, Libkol, Libroksil

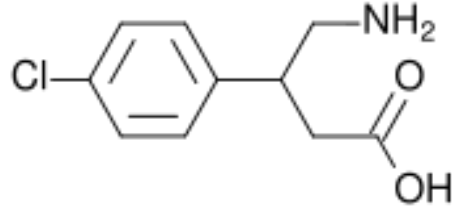


7-chloro-2-methylamino-5-phenyl-3H-1,4-benzodiazepine-4-oxide

- Long acting derivative used in muscle spasms
- More sedation and drowsiness than diazepam was observed.



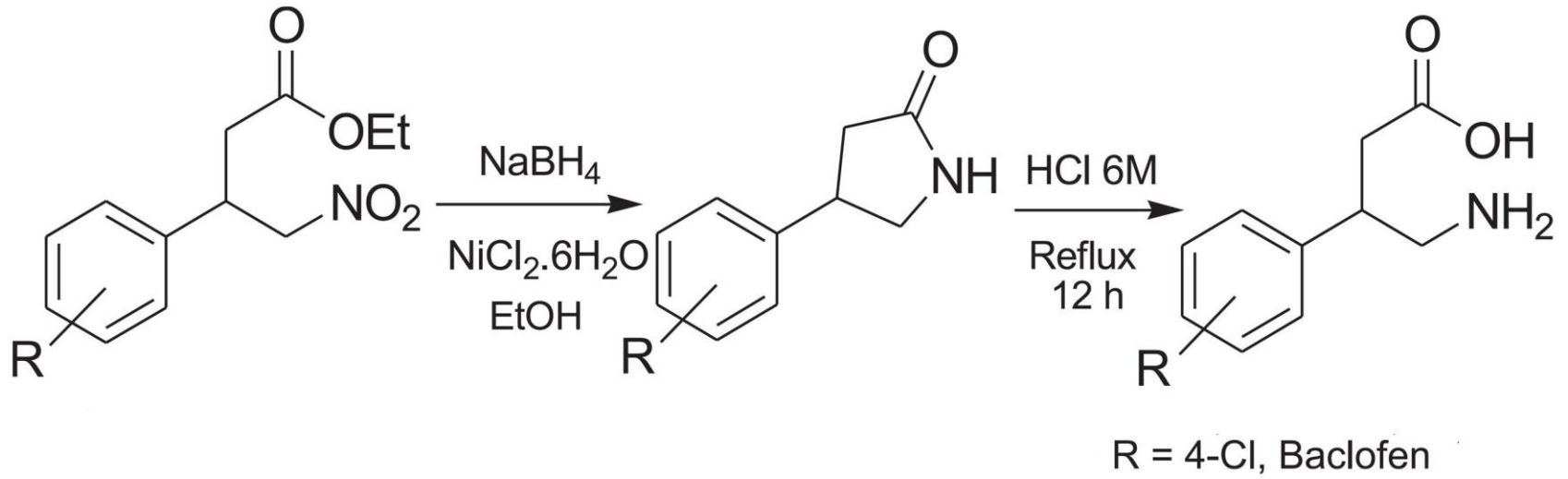
Baclofen Lioresal



β -Aminomethyl-p-chlorohydrocinnamic acid

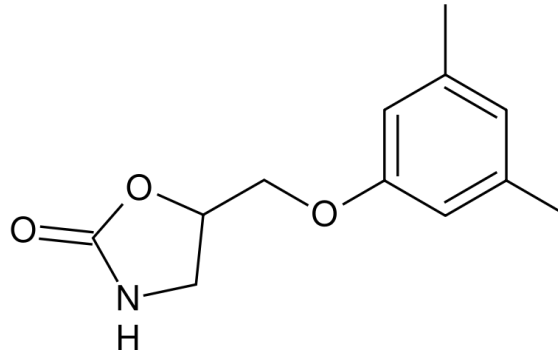
- the derivative of the inhibitor mediator GABA.
- When GABA is administered systemically, can not pass to CNS, but baclofen goes through the CNS.
- Muscle relaxant effect is on the spinal cord.
- The central muscle relaxant effect is limited.
- Used in spasm due to multiple sclerosis and spinal cord lesions
- Absorbed in gastro-intestinal tract
- 70% removed from the kidneys unchanged
- Side effect; numbness, dizziness, hypotension, nausea

Synthesis of Baclofen



Other Medicines

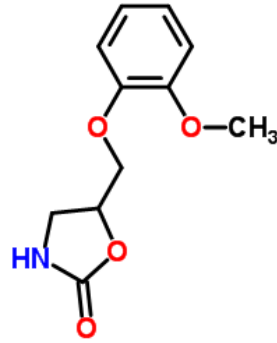
Metaloxone:



5- (3,5-dimethylphenoxy) methyl-2-oxazolidinone

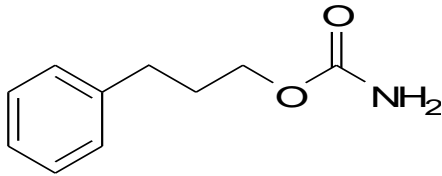
- Hepatotoxic
- Not used clinically

Mefenoxalone Dorsiflex, Dorsilon, Seskafleks



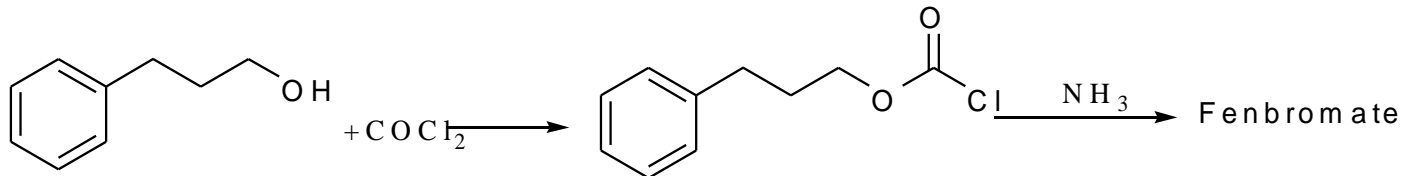
5- (2-methoxyphenoxy)
methyl-2-oxazolidinone

- **Fenbromate** Gamakuil, Kuilil, Gamaflex, Kuiflex

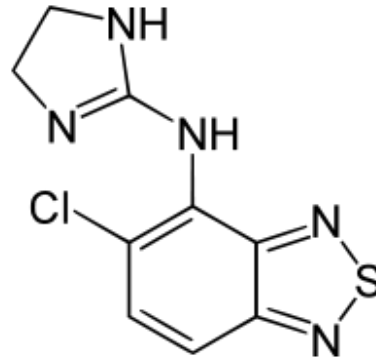


3-Phenylpropanol carbamate

Synthesis;

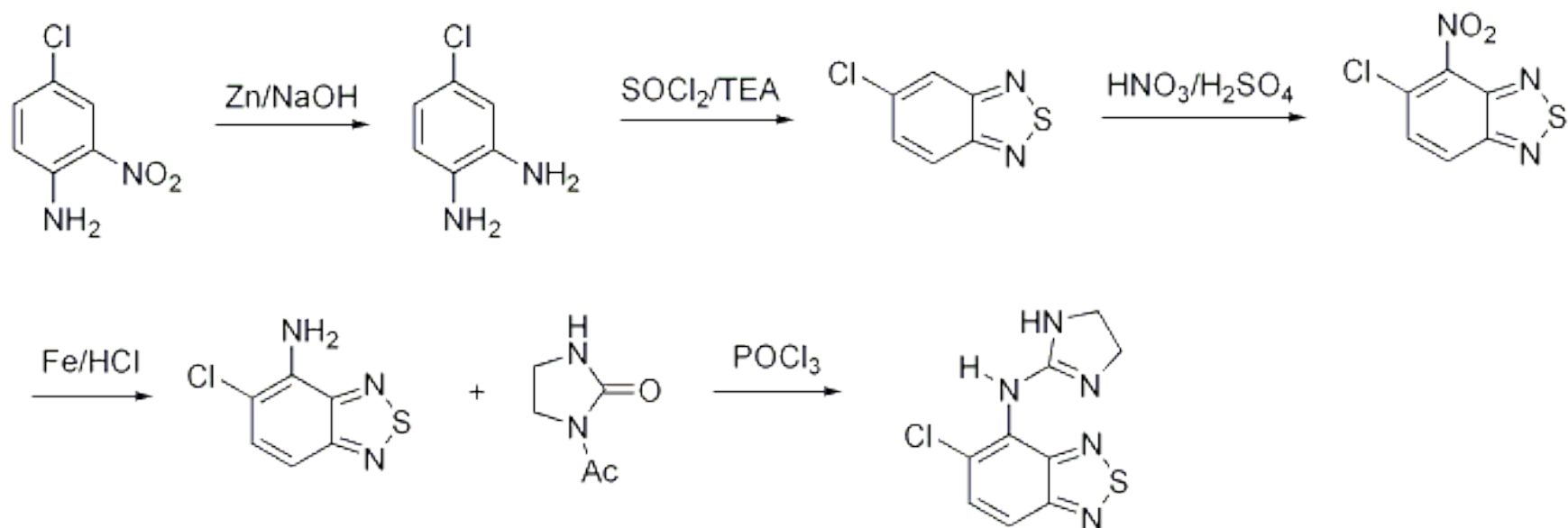


Tizanidine Sirdalud, Devalud



5-Chloro-4- (2-imidazolin-2-yl-amino) 2,1,3-benzothiadiazole

- Decreases spinal cord muscle tone.
- Effective in muscle spasms due to spinal lesions
- Side effect; sedation, insomnia, dry mouth, dizziness, nausea, hypotension



Huaxua Shiji, 2003, 25, 115

Jpn. Kokai Tokkyo Koho, 17258251, 09 Oct 1995