

Product Data Sheet

Product Name: Alendronate sodium hydrate

Cat. No.: GC10348

Chemical Properties

Cas. No. 121268-17-5

Chemical Name sodium hydrogen(4-amino-1-hydroxy-1-phosphonobutyl)phosphonate trihydrate

SMILES [O-]P(O[H])(C(O[H])(C([H])([H])C([H])([H])C([H])([H])N([H])([H])P(O[H])(O[H])=O)=O.[H]O[H].[H]O[H].[H]O[H].[Na+]

Formula C₄H₁₈NNaO₁₀P₂

M.Wt 325.12

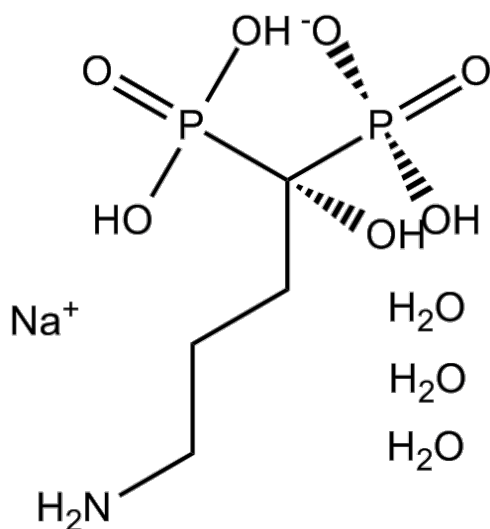
Solubility ≥ 5.57mg/mL in Water

Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Caution: Product has not been fully validated for medical applications. For research use only.

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Cell lines

Human bone cells

Preparation Method

A stock solution of Alendronate sodium hydrate was prepared by dissolving at a concentration of 10mol/L in DMEM. Culture media were prepared at final concentrations of alendronate between 10^{-12} to 10^{-1} mol/L, with 1:10 serial dilutions of the stock solutions. Medium with or without Alendronate sodium hydrate was then added and the cells incubated for 48 or 96h.

Reaction

Conditions

10^{-12} to 10^{-1} mol/L; 48 or 96h

Applications

After 96 h of incubation, cell viability was significantly decreased at the Alendronate sodium hydrate concentration of 10^{-4} mol/L.

Animal experiment [2]:

Animal models

Ovariectomized female Wistar rats

Preparation Method

The animals were divided into four groups: ovariectomized (OVX group); ovariectomized and treated with 1mg/kg or 2mg/kg Alendronate sodium hydrate (ALN) salt diluted in saline solution (Group OVX + ALN1 and Group OVX + ALN2); and a sham operated group used as the control.

Dosage form

1 or 2mg/kg; s.c.; twice a week

Applications

The rats began treatment immediately following ovariectomy and both doses of Alendronate sodium hydrate proved effectiveness in controlling mineral loss.

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References:

- [1] Garcia-Moreno C, Serrano S, Nacher M, Farré M, Diez A, Marinoso ML, Carbonell J, Mellibovsky L, Nogués X, Ballester J, Aubía J. Effect of alendronate on cultured normal human osteoblasts. *Bone*. 1998 Mar 1;22(3):233-9.
- [2] Salazar M, Hernandez L, Ramos AL, de Oliveira Salazar B, Micheletti KR, Paranhos LR, de Mendonça MR, Cuoghi OA. Effect of alendronate sodium on tooth movement in ovariectomized rats. *Archives of oral biology*. 2015 May 1;60(5):776-81.

Background

Alendronate sodium hydrate is a nitrogen-containing bisphosphonate that strongly inhibits bone resorption, it is often used in research on the prevention and treatment of osteoporosis [1]. Alendronate sodium hydrate has a strong affinity for circulating calcium and minerals on the bone surface, and inhibits the enzyme activity in osteoclasts, thereby hindering the dissolution of bone tissue and the degradation of collagen [2].

Alendronate sodium hydrate (10^{-4} mol/L) incubated for 48 hours significantly reduced the collagen synthesis of osteoblasts. Alendronate sodium hydrate at a concentration of 10^{-12} - 10^{-5} mol/L has no effect on calcium deposition in normal human osteoblasts [3].

Alendronate sodium hydrate (25mg/kg) treatment twice each week for 8 weeks, exhibited a reversal of mouse liver fibrosis to a significant extent, and the expression of α -SMA positive cells in the hepatic fibrosis area was significantly reduced in CCl₄ induced liver fibrosis mouse model [4].

Alendronate sodium hydrate (0.01 to 0.25mg/kg, s.c., 11 days) preserves alveolar bone resorption and has anti-inflammatory and antibacterial activities in experimental periodontitis [5]. Alendronate sodium hydrate pretreated mice (0.1mg/kg twice a week or once a week) combined with paclitaxel administration (10-50mg/kg/day twice a week or once a week) statistically significantly blocked the growth of PC3 ML tumors in bone marrow and soft tissue. And significantly improve survival time [6].

References:

- [1] Bell NH, Johnson RH. Bisphosphonates in the treatment of osteoporosis. *Endocrine*. 1997 Apr;6:203-6.

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- [2] Iwamoto J, Miyata A, Sato Y, Takeda T, Matsumoto H. Five-year alendronate treatment outcome in older postmenopausal Japanese women with osteoporosis or osteopenia and clinical risk factors for fractures. *Therapeutics and Clinical Risk Management*. 2009 Oct 12:773-9.
- [3] Garcia-Moreno C, Serrano S, Nacher M, Farré M, Diez A, Marinoso ML, Carbonell J, Mellibovsky L, Nogués X, Ballester J, Aubía J. Effect of alendronate on cultured normal human osteoblasts. *Bone*. 1998 Mar 1;22(3):233-9.
- [4] Bi WR, Jin CX, Xu GT, Yang CQ. Effect of alendronate sodium on the expression of mesenchymal-epithelial transition markers in mice with liver fibrosis. *Experimental and Therapeutic Medicine*. 2013 Jan;5(1):247-52.
- [5] Menezes AM, Rocha FA, Chaves HV, Carvalho CB, Ribeiro RA, Brito GA. Effect of sodium alendronate on alveolar bone resorption in experimental periodontitis in rats. *Journal of periodontology*. 2005 Nov;76(11):1901-9.
- [6] Stearns ME, Wang M. Effects of alendronate and taxol on PC-3 ML cell bone metastases in SCID mice. *Invasion & Metastasis*. 1996 Jan 1;16(3):116-31.

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