Product Information

Phenylmethanesulfonyl Fluoride

≥98.5% (GC)

P7626

Product Description

CAS Registry Number: 329-98-6

Synonyms: PMSF, α-toluenesulfonyl fluoride, benzylsulfonylfluoride, phenylmethylsulfonyl fluoride

Molecular Mass: 174.19

Molecular Formula: $C_7H_7FO_2S$

Melting Point:[1] 91-92 °C

Phenylmethanesulfonyl fluoride (PMSF) is a general inhibitor of serine proteases,[2] such as chymotrypsin, trypsin, and thrombin. PMSF inhibits serine proteases by sulfonating the hydroxyl groups of reactive-site serine residues.[3-6] At relatively higher concentrations, PMSF also inhibits cysteine proteases.[7]

Several theses[7,8] and dissertations[9-23] have cited use of product P7626 in their protocols.

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

PMSF is considered to be a highly toxic cholinesterase inhibitor.

Preparation Instructions

This product is soluble at 0.2 M (200 mM) in anhydrous isopropanol. When needed, sonication (or gentle heating, if absolutely necessary) may be applied to dissolve fully the PMSF. Stock solutions of PMSF may be prepared at 100 mM in either:

- anhydrous isopropanol,[24] or
- anhydrous (**100%**, not 95%) ethanol[25]

Storage/Stability

A 200 mM PMSF solution in dry solvent has been reported to remain active for at least 9 months at 2-8 °C.[27] 100 mM PMSF solutions in isopropanol may be stored at –20 °C for several months.[24]

PMSF is very unstable in the presence of water, as PMSF is susceptible to hydrolysis of the fluoride moiety. Half-life values of PMSF in aqueous solutions at 25 °C have been reported as follows:[27]

- pH 7.0: 110 minutes
- pH 7.5: 55 minutes
- pH 8.0: 35 minutes

References

1. Fahrney, D.E., and Gold, A.M., *J. Am. Chem. Soc.*, **85(7)**, 997-1000 (1963).
2. Turini, P. *et al.*, *J. Pharmacol. Exp. Ther.*, **167(1)**, 98-104 (1969).
3. Gold, A.M., *Methods Enzymol.*, **11**, 706-711 (1967).
4. Gold, A.M., and Fahrney, D., *Biochemistry*, **3(6)**, 783-791 (1964).
5. Hedstrom, L., *Chem. Rev.*, **102(12)**, 4501-4524 (2002).)
6. Powers, J.C. *et al.*, *Chem. Rev.*, **102(12)**, 4639-4750 (2002).
7. van der Hoorn, R. *et al.*, *Plant Physiol.*, **135(3)**, 1170-1178 (2004).
8. Harasym, Anne Catherine, "Factors influencing glucose homeostasis in a rat model with mutated ATP synthase". University of Alberta, M.Sc. thesis, p. 35 (2012).
9. Holinier, Charlotte, "Novel tools to study polyphosphate biology in *S. cerevisiae* (yeast) and mammalian cells". University of Ottawa, M.Sc. thesis, pp. 94, 95 (2018).
10. Mouzannar, Raymond, "Higher order chromatin degradation induced by hydrogen peroxide in glial cells". West Virginia University, Ph.D. dissertation, p. 24 (2001).
11. Kintarak, Sompid, "Effects of *Staphylococcus Aureus* on Human Keratinocytes". University of London, Ph.D. dissertation, p. 216 (2003).

12. Xu, Meng, "Specialised Transcription Factories". Oxford University, Ph.D. dissertation, p. 49 (2007).
13. Jiang, Yan, "Chromatin Remodeling in Transgenic Mouse Brain: Implications for the Neurobiology of Depression". University of Massachusetts Medical School, Ph.D. dissertation, p. 117 (2009).
14. Liu, Fushan, "Protein-Protein Interactions Between Starch Synthetic Enzymes in Cereals". University of Guelph, Ph.D. dissertation, p. 121 (2010).
15. Steagall, Lisa Ferguson, "The Effects of Carbohydrate-Protein Supplementation on Endurance Exercise Performance, Recovery, and Training Adaptation". University of Texas at Austin, Ph.D. dissertation, pp. 228, 231 (2010).
16. Yip, Cindy Ying Yin, "Pathology of Calcific Aortic Valve Disease: The Role of Mechanical and Biochemical Stimuli in Modulating the Phenotype of and Calcification by Valvular Interstitial Cells". University of Toronto, Ph.D. dissertation, pp. 153, 157 (2010).
17. Ozcelik, Sefika, "Mechanisms of tau fragmentation, aggregation and degradation in transgenic mouse models". Universität Basel, Ph.D. dissertation, p. 74 (2013).
18. Ayoub, Marwa M.R.R., "Effect of some intranasal formulations used in the management of allergic rhinitis on mucociliary function". University of Bristol, Ph.D. dissertation, p. 82 (2015).
19. Ko, Dae Kwan, "Clock-regulatory networks contributes to growth vigor in maize hybrids". University of Texas at Austin, Ph.D. dissertation, pp. 93, 96 (2016).
20. Sundaram, Aishwarya, "Linking Metabolic Syndrome and Pancreatic Cancer Through Transcriptional Regulation and Secreted Factors from White Adipocytes". Ruperto-Carola University Heidelberg, Dr. rer. nat. dissertation, p. 75 (2016).
21. Li, Wenjiao, "Autophagy Enhanced by Rassf1a Suppresses Diethylnitrosamine (Den)-Induced Hepatocarcinogenesis". Texas A&M University, Ph.D. dissertation, p. 17 (2017).
22. Oben, Karine Zinkeng, "Therapeutic Potential of Targeting Reactive Oxygen Species (ROS) Stress in Myelodysplastic Syndrome (MDS)". University of Kentucky, Ph.D. dissertation, p. 28 (2017).
23. Lawler, Megan Frances, "Probing the Interfaces of Epigenetic Complexes: Efforts Towards Elucidating and Targeting Critical Protein:Protein and Protein:lncRNA Interactions of Lysine-Specific Demethylase 1 (KDM1A/LSD1)". Duke University, Ph.D. dissertation, pp. 59, 72, 84, 95, 100, 113, 118, 119, 135-138, 219 (2019).
24. Raptis, L. *et al.*, in *Cell Biology Assays: Essential Methods* (Geri, K., ed.). Academic Press/Elsevier (London), p. 189 (2010).
25. Lindeman, L.C. *et al.*, *Methods Mol. Biol.*, **567**, 75-86 (2009).
26. Beynon, R.J., and Bond, J.S. (eds.), *Proteolytic Enzymes: A Practical Approach*. IRL Press at Oxford University Press (Oxford, UK), p. 246 (1989).
27. James, G.T., *Anal. Biochem.*, **86(2)**, 574-589 (1978).

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P7626pis Rev 06/22 GCY,FEB,RBG,MAM