Phenylacetic acid

Phenylacetic acid		
[[Image:Kwas fenylooctowy.svg		Phenylacetic acid]]
[[Image:Phenylacetic-acid-3D-balls-B.png		Ball-and-stick model]]
Identifiers		
CAS number	103-82-2 [1] ✓	
ChemSpider	10181341 [2] ✓	
UNII	ER5I1W795A [3] ✓	
ChEMBL	CHEMBL1044 [4] ✓	
Jmol-3D images	Image 1 [5]	
Properties		
Molecular formula	$C_8H_8O_2$	
Molar mass	136.15 g/mol	
Density	1.0809 g/cm^3	
Melting point	76-77 °C	
Boiling point	265.5 °C	
Acidity (pK_a)	4.31[6]	
Hazards		
MSDS	External MSDS [7]	
✓ (what is this?) (verify) [8] Except where noted otherwise, data are given for materials in their standard state (at 25 °C, 100 kPa)		
Infobox references		

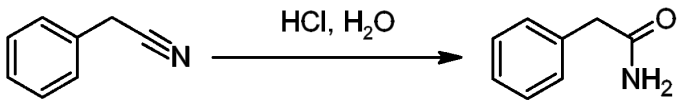
Phenylacetic acid (abr. **PAA** and synonyms are: **α-toluic acid**, **benzeneacetic acid**, **alpha tolylic acid**, **2-phenylacetic acid**) is an organic compound containing a phenyl functional group and a carboxylic acid functional group. It is a white solid with a disagreeable odor. Because it is used in the illicit production of phenylacetone (used in the manufacture of meth/amphetamines), it is subject to controls in the United States.

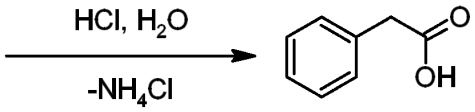
Occurrence

Phenylacetic acid has been found to be an active auxin (a type of plant hormone),[9] predominantly found in fruits. However its effect is much weaker than the effect of the basic auxin molecule indole-3-acetic acid. It is also the oxidation product of phenethylamine when acted on by the enzyme monoamine oxidase found in humans and many other organisms.

Preparation

This compound may be prepared by the hydrolysis of benzyl cyanide:[10] [11]





Applications

Phenylacetic acid is used in some perfumes, possessing a honey-like odour in low concentrations, and is also used in penicillin G production. It is also employed to treat type II hyperammonemia to help reduce the amounts of ammonia in a patient's bloodstream by forming phenylacetyl-CoA which then reacts with nitrogen-rich glutamine to form phenylacetylglutamine. This compound is then secreted by the patient's body.

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References

[1] http://www.commonchemistry.org/ChemicalDetail.aspx?ref=103-82-2
[2] http://www.chemspider.com/10181341
[3] http://fdasis.nlm.nih.gov/srs/srsdirect.jsp?regno=ER5I1W795A
[4] https://www.ebi.ac.uk/chembldb/index.php/compound/inspect/CHEMBL1044
[5] http://chemapps.stolaf.edu/jmol/jmol.php?model=O%3DC%28O%29Cc1ccccc1
[6] Dippy, J.F.J., Hughes, S.R.C., Rozanski, A., *J. Chem Soc.*, **1959**, 2492.
[7] http://ptcl.chem.ox.ac.uk/MSDS/PH/phenylacetic_acid.html
[8] http://en.wikipedia.org/wiki/%3Aphenylacetic_acid?diff=cur&oldid=417793686
[9] Wightman, Frank; Lighty, Douglas L. (1982). "Identification of phenylacetic acid as a natural auxin in the shoots of higher plants". *Physiologia Plantarum* **55** (1): 17. doi:10.1111/j.1399-3054.1982.tb00278.x.
[10] Roger Adams; A. F. Thal (1941), "Phenylacetic acid" (http://www.orgsyn.org/orgsyn/orgsyn/prepContent.asp?prep=cv1p0436), *Org. Synth.*, ; *Coll. Vol.* **1**: 436
[11] Wilhelm Wenner (1963), "Phenylacetamide" (http://www.orgsyn.org/orgsyn/orgsyn/prepContent.asp?prep=cv4p0760), *Org. Synth.*, ; *Coll. Vol.* **4**: 760

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