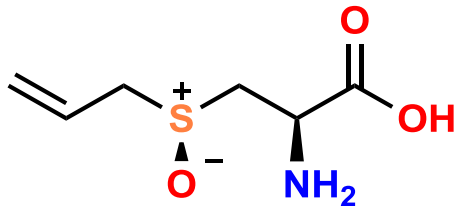
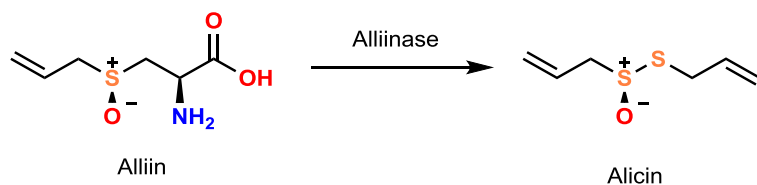


Alliin

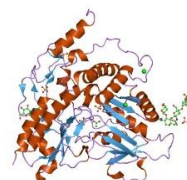


Discovered and synthesized by Stoll and Seebeck in 1949. Alliin undergoes enzymatic cleavage to allicin via alliinase when garlic is crushed. Alliin and alliinase are stored in different parts of the garlic clove, which must be crushed for them to come into contact with each other. Alliin must be extracted at low temperatures (< °C) in order to prevent this reaction from occurring. A precursor to the smell of fresh garlic, alliin is an odorless compound. Allicin has been found to inhibit the growth of *H. pylori*, the bacteria responsible for gastric ulcers.

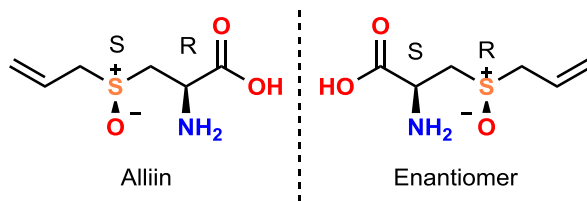
Conversion of alliin to allicin



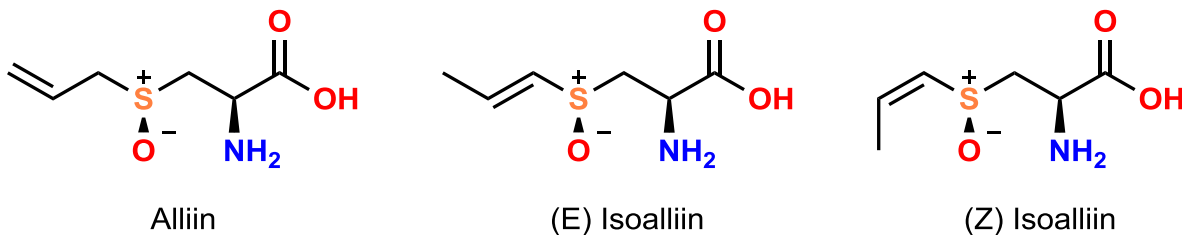
Alliinase C



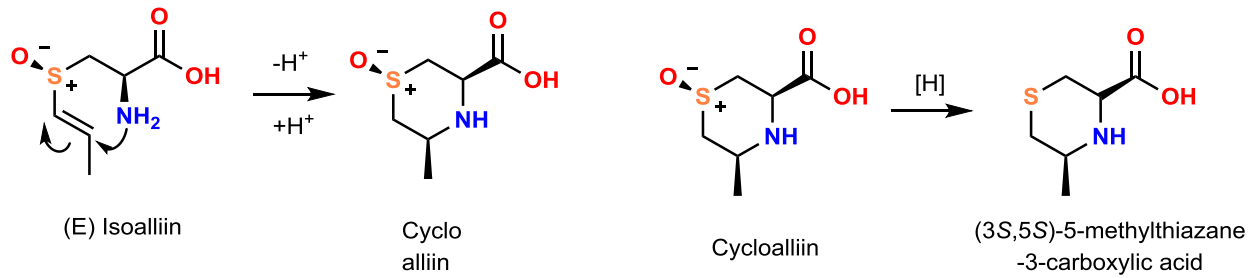
Because the sulfur on the sulfoxide is chiral, alliin has two stereocenters. Mirroring through a plane produces alliin's enantiomer. Alliin was the first compound discovered to have both sulfur and carbon stereocenters. Only the natural compound will react with alliinase to produce an odor.



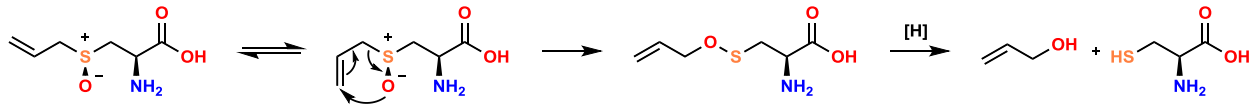
A constitutional isomer of alliin, isoalliin, has two possible stereoisomers (E/Z). It is a lachrymator precursor found in onions similar to the role alliin plays in garlic. Isolated by Virtanen in 1961.



The E stereoisomer readily undergoes cyclization through an intramolecular Michael addition to form cycloalliin. Cycloalliin shows low bioavailability due to reduction by intestinal flora.



Alliin can undergo a 2,3 sigmatropic rearrangement to a sulfenate, which is then reduced to allyl alcohol and cysteine.



Synthesis:

