

NAME: _____

Quiz 28

Proline Synthesis

1. Draw glutamate.
2. Glutamyl-kinase phosphorylates the side chain carboxylic acid.
3. Glutamyl-phosphate dehydrogenase reduces the phosphorylated carboxylic acid of the side chain to an aldehyde. The phosphate group leaves as inorganic phosphate.
4. The backbone amine acts as a nucleophile, the aldehyde carbonyl carbon acts as an electrophile, and the aldehyde carbonyl oxygen leaves as water. This forms the cyclic ring found in proline, with a C=N (imine).
5. The imine is reduced to yield a methylene carbon and a secondary amine. Proline!