

CONCEPT: REACTIONS OF AMINO ACIDS: NINHYDRIN TEST

- Amino acids are _____ compounds and become visually detectable using *ninhydrin*.

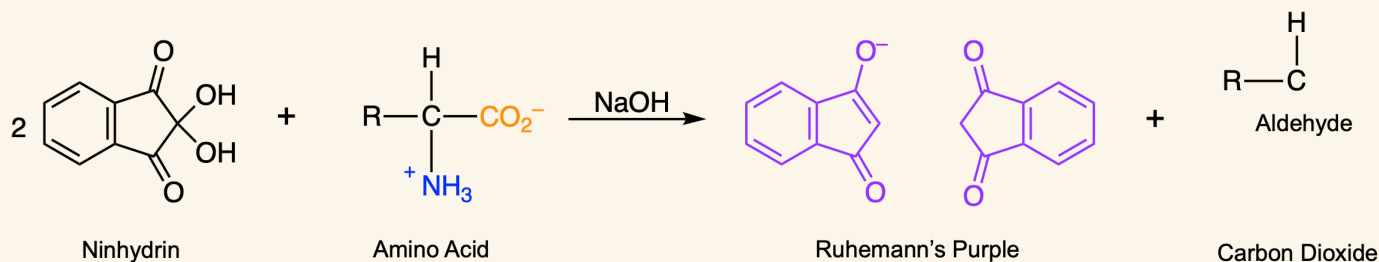
□ **Ninhydrin:** an aromatic diketone hydrate that reacts with _____ amines of amino acids.

- Produces a dye called _____ purple.

□ **Real-World Application:** In forensics, used to detect fingerprints on surfaces.



Ninhydrin Test



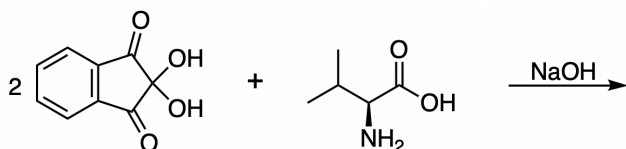
- Reaction outcomes of amino acid degradation:

① **Deamination:** The _____ group incorporates within the dye.

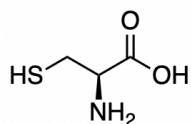
② **Decarboxylation:** The **carboxyl** group is lost as _____.

③ **Aldehyde Formation:** The α -C gains a _____ group.

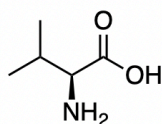
EXAMPLE: Draw the products formed when valine reacts with ninhydrin.



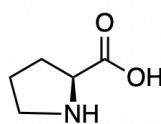
PRACTICE: Which of the following amino acids would not create an aldehyde as a by-product?



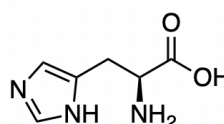
Cysteine



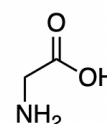
Valine



Proline



Histidine



Glycine

a) Cysteine

b) Valine

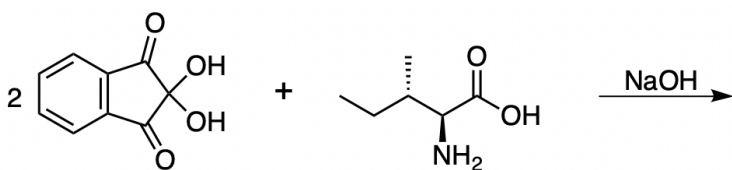
c) Proline

d) Histidine

e) Glycine

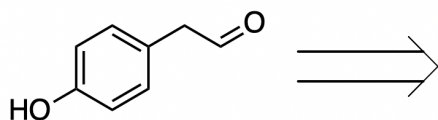
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PRACTICE: Name the aldehyde formed when isoleucine reacts with ninhydrin.



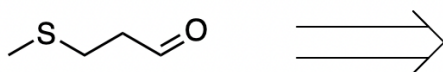
- a) (*R*)-2-methylbutanal b) Pentanal c) (*S*)-2-methylbutanal d) (*S*)-3-methylbutanal

PRACTICE: The following aldehyde is obtained from the reaction between an amino acid and ninhydrin. Select the structure of the amino acid used initially.



- a)
- b)
- c)
- d)

PRACTICE: Provide the name of the amino acid used to create the following aldehyde after its reaction with ninhydrin.



- a) Glycine b) Lysine c) Threonine d) Methionine e) Proline