

## Lab (1) Qualitative Tests of Amino Acids

### Experiment (1) Solubility test

#### Materials:

##### Chemical

0.1% Glycine, 0.1% arginine, 0.1% glutamine, distilled water, NaOH, HCl and chloroform.

##### Equipment and Glassware

Test tubes, rack, pipette, pipette pump, water bath.

#### Protocol:

1. Add 2 ml of different solvents in 4 clean test tubes then place 0.5 ml of glycine.
2. Shake the tubes thoroughly, then leave the solution for about one minute.
3. Notice what happened to the solution.
4. Repeat steps 1-3 for arginine and glutamine.
5. Record your results.

#### Results:

Amino acid	Solvent	Degree of solubility
Glycine	Water	
	NaOH	
	HCl	
	Chloroform	
Arginine	Water	
	NaOH	
	HCl	
	Chloroform	
Glutamine	Water	
	NaOH	
	HCl	
	Chloroform	

### Experiment (2) Ninhydrin test

#### Materials:

##### Chemical

0.1% Glycine, 0.1% tryptophan, 0.1% proline, distilled water, 0.2% Ninhydrin reagent\*.

**\*Caution:** Ninhydrin is a strong oxidizing agent, it should be handled with care, and applied apart from contact with skin or eyes, gloves and mask is a must, using hood is required, if accidentally get in touch with the skin, the resulting stains is a temporarily one, that will be eliminated within 24 hours.

**Equipment and Glassware**

Test tubes, rack, pipette, pipette pump, water bath.

 **Protocol:**

1. Label four tubes (1 - 3), then add 1 ml of each amino acid (glycine, tryptophan and proline).
2. Add 1 ml of ninhydrin solution.
3. Boil the mixture over a water bath for 2 min.
4. Allow to cool and observe the blue-purple color formed.
5. Record your results.

 **Results:**

Tube	Observation
Glycine	
Tryptophan	
Proline	

**Experiment (3) Xanthoproteic test** **Materials:****Chemical**

0.1% Tyrosine, 0.1% tryptophan, 0.1% phenylalanine, 0.1% w/v phenol, distal water, con. HNO<sub>3</sub> \*, 10 M NaOH.

\***Caution:** Concentrated HNO<sub>3</sub> is a toxic, corrosive substance that can cause severe burns and discolour your skin. Prevent eye, skin and cloth contact. Avoid inhaling vapors and ingesting the compound. Gloves and safety glasses are a must; the test is to be performed in a fume hood.

**Equipment and Glassware**

Test tubes, rack, pipette, pipette pump, water bath.

 **Protocol:**

1. Label four tubes (1 - 4), then add 1 ml of each amino acid solutions (tyrosine, tryptophan and phenylalanine) and phenol solution to those test tubes each alone.
2. Add 1 ml of concentrated HNO<sub>3</sub>.
3. Boil the mixture over a water bath for 1 min. Then record your results.
4. Now COOL THOROUGHLY under the tap and CAUTIOUSLY add 5 drops of 10M NaOH to make the solution strongly alkaline.
5. Record your results.

 **Results:**

Tube	Observation	
	+ HNO <sub>3</sub>	+NaOH
Tyrosine		
Tryptophan		
Phenylalanine		
Phenol		

**Experiment (4) Sakaguchi test** **Materials:****Chemical**

0.1% Glycine, 0.1% arginine, distilled water, 10% NaOH,  $\alpha$ -naphthol in 10% ethanol, 5% sodium hypobromate.

**Equipment and Glassware**

Test tubes, rack, pipette, pipette pump, water bath.

 **Protocol:**

1. Label 2 test tube and put in each one 2 ml of the amino acid solution.
2. Add to each tube 2ml of NaOH solution. Mix well
3. Add to each tube 5 drops of  $\alpha$ -naphthol solution. Mix well.
4. Add to each tube 5 drops of sodium hypobromite solution.
5. Record your result.

 **Results:**

Tube	Observation
Glycine	
Arginine	