Coordination chemistry of transition metals has been interest for several years. Copper(II) amino acid complexes in recent years have been receiving much attention. The complexes of copper are particular interest due to their biological and antitumor properties. Copper(II) can inactivate the HIV protease. The ternary complexes of copper(II) plays an important role in biological processes. Proteins constitute one of the most common classes of substances present in biological systems. Their chemical properties are of fundamental importance to understand cell mechanisms as membrane transport, secretion or digestion. Amino acids are the building units of all proteins and enzymes. Amino acids have two principal potentially active sites in the formation of complexes, the acid carboxyl group and the basic amino group. However, natural amino acids can also include other functional groups in the chain during the peptide bond formation with sites for chemical activity in the peptide chains. Preparation and characterization of Cu(II) complexes with amino acids also investigated.

The objective of this work involved the preparation and characterization of ternary complexes of copper(II) with oxalate as primary ligand and amino acids (aspartic acid and cysteine) as secondary ligand.

All the chemicals were of high purity and were used as purchased, without any further purification. Copper(II) nitrate, oxalic acid, L-aspartic acid, cysteine, methanol were used throughout this work. All experiments were carried out in open air. Nano pure-quality water and the ethanol of Merck were used. All experimental were carried out in open air.

The infrared spectra were recorded on a 470 Shimadzu infrared spectrophotometer as KBr pellet (in the spectra region 4000-400 cm⁻¹). The electronic absorption spectra measurements were carried out on UV-160 A Shimadzu spectrophotometer. The elemental analysis performed by an elemental Costech- ECS- 4010 apparatus. The Horiba-conductivity meter Es14 was used for electro conductivity of complexes.

Synthesis of complexes K₂[Cu(OX)₂(H₂O)₂]: Water solutions of oxalate complexes of Cu were prepared. For preparation of K₂[Cu(ox)₂(H₂O)₂], 1 mmol of CuCl₂ (0.134 g) was dissolved in 5 mL of water. Then solution containing 1 mmol (0.184 g) of K₂C₂O₄·2H₂O in 2 mL H₂O was added. The blue precipitate was formed after 1 h.

Preparation of complexes [Cu (amino acid)₂(H₂O)₂]: For preparation of [Cu (amino acid)₂(H₂O)₂], 1 mmol (0.134 g) of CuCl₂·2H₂O in 2 mL H₂O dissolved. Then 1 mmol of amino acids (1-aspartic acid, 2-cysteine) in 2 mL H₂O was added. The reaction mixture continuous stirred for 1 h. The resulting solution was filtered off to removed impurities and the allowed to stand at room temperature.

Preparation of complexes K₃[Cu(OX)(amino acid)]: The mixed ligand amino acid- oxalate complexes of Cu(II) were prepared by reaction solutions of oxalate complexes. The suitable amount (1 mmol) of amino acids (1-6) dissolved in water and added (amino acid 1-aspartic acid, 2-cysteine). The resulting mixture was filtered off, washed with a mixture of EtOH and H₂O (1:1). The product was dried in room temperature.
All the complexes are air stable and these compounds are soluble in water at room temperature.

The structure of the complexes was determined by elemental analysis, electronic spectra and molar conductance. The conductivity measurements of the binary and ternary mixed ligand complexes were taken in water. The observed molar conductance values of the mixed ligand complexes indicate their non electrolytic nature.

The important IR spectral bands for the ligands and their complexes are given in Table-2. The IR frequencies indicate their non electrolytic nature. The IR frequencies for ligands are in good agreement with those reported in the literature.¹²,¹³

**REFERENCES**