

# Studies of Physical and Chemical Compounds

## Charge Transfer Between Amino Acids and Iodine

### and its Applications in the Industry of Unconventional Organic Connectors

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**Abstract:** *Tri-iodide charge-transfer complexes synthesized upon the chemical interaction between iodine and tryptophan or tyrosine were characterized using different spectroscopic techniques (e.g., infrared, Raman, electronic, X-ray powder diffraction (XRD) and scanning electron microscopy (SEM). The triiodide charge-transfer complexes were prepared by dry grinding of potassium iodide, iodine and amino acid with 1:1:1 molar ratio in presence of few drops of methylene chloride solvent. The electronic spectra exhibit two absorption bands around 360 and 280 nm due to the formation of the triiodide ion ( $I_3^-$ ). The Raman spectra show the characteristic bands for the triiodide ion at 160, 126 and 100  $cm^{-1}$ , which are assigned to  $\nu_{as}(I-I)$ ,  $\nu_s(I-I)$  and  $\delta(I_3^-)$ , respectively. The iodine complexes were shown to contain the triiodide species based on the electronic absorptions as well as on the Raman absorption bands characteristic for the non-linear triiodide species,  $I_3^-$ , with  $C_{2v}$  symmetry. The proposed structures of these complexes are further supported by thermal analyses measurements. The DC electrical properties as a function of temperature of these charge transfer complexes have been studied.*

**Keywords:** Tryptophan; tyrosine; iodine; charge-transfer complexes; DC electrical; Raman spectroscopy