Abstract

Results are reported from a potentiometric and spectroscopic (UV-visible, CD, and ESR) of the protonation constants and Cu(II)-complex stability constants of leucine enkephalin amide (H-Tyr-Gly-Gly-Phe-Leu-NH2, Leu-EN-amide) and two nitro analogs having 4-nitro substituent on the phenyl ring of the Phe residue, (H-Tyr-Gly-Gly-Phe(NO2)-LeuNH2, Leu-EN(nitro)- amide) and the other one with a sarcosine residue replacing the Gly3 residue (Leu-ENSar-amide). Over the pH range of 6-8.5, Leu-EN-amide interacts more strongly with Cu(II) than does the methionine analog, forming a more stable complex with three nitrogens coordinated. The Sar residue acts as a "breakpoint" to the formation of 3N or 4N complexes and, as a result, causes the formation of dimeric complexes bonded through the amino-N, a deprotonated peptide-N- and deprotonated Tyr-O- donors.