

SYNTHESIS, CHARACTERIZATION AND COORDINATION BEHAVIOUR OF NEW HEMORPHIN-7 ANALOGUES TOWARDS TRANSITION METAL IONS

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Hemorphin-7 is a naturally occurring, endogenous opioid peptide of the Hemorphin family with affinity for opioid receptors and morphinomimetic properties. Hemorphin-7 is a short-chain peptide initially obtained from a particular region of the β -chain of hemoglobin. The Hemorphin peptides are increasingly being used in the treatment of various diseases such as hypertension, epilepsy, diabetes, chronic pain, cancer, and etc. Despite the fact that Hemorphin analogues are potential ligands, reports on its complexing behaviour are very sparse. However, its ligand properties depend on the presence of the amino nitrogen atom so that it acts as a mono-/bidentate ligand. Peptide analogues containing coordination groups could be used as a chemosensor towards some transition metal ions. The aim of this research is to investigate the properties of new hemorphin-7 analogues (sensitivity, formal constant, stoichiometry) as ligands for several transition metal ions in a wide range of concentration of the reagents. The new synthesis molecules were successfully used to investigate the level of Cu(II), Co(II), Ni(II), Pb(II) in waste water samples using different analytical techniques. The results revealed that the sensors provided electrochemical and spectrochemical sensing excellent response with low limit of detection.

References

1. Blishchenko, E.Y.; Sazonova, O.V.; Kalinina, O.A.; Yatskin, O.N.; Philippova, M.M.; Surovoy, A.Y.; Karelin, A.A.; Ivanov, V.T. *Peptides*. 2002, 23, 903.
2. Glämsta, E.L.; Morkrid, L.; Lantz, I.; Nyberg, F. *Regul. Peptides*. 1993, 49, 9.
3. Duethman, D.; Dewan, N.; Conlon, J.M. *Peptides*. 2000, 21, 137.
4. Dobolyi, A.; Kékesi, K.A.; Juhász, G.; Székely, A.D.; Lovas, G.; Kovács, Z. *Curr. Med. Chem.* 2014, 21, 764.

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