Methods and objects of chemical analysis, 2015, Vol. 10, No. 3, 108-112

Luminescent Determination of α-Bitter Acids in Hops

S.V. Beltyukova[1], Ie.V. Cherednychenko[1]*, O.I. Teslyuk[2]

[1] Odessa National Academy of Food Technologies, Kanatnaya st., 112, Odessa, Ukraine, 65039;
*e-mail: okorochoco@gmail.com
[2] Bogatskii Physicochemical Institute, National Academy of Sciences of Ukraine, Lyustdorfskaya dor. 86, Odessa,Ukraine, 65080

Recieved: July 02, 2015; Accepted: September 12, 2015

Luminescent properties of the Tb(III) complex with α-bitter hop acids are studied. Dependence of intensity of a luminescence of a complex on concentration of terbium, α-bitter acids, acidity is investigated. It is shown that effective transfer of energy of excitation from ligands to a lanthanide ion takes place in a complex, this causes an intensive luminescence. Influence of solvents on intensity of a luminescence of a complex is studied. It is established that optimal $I_{lum.}$ is found in the presence of a dimethyl sulfoxide and in aqueous-alcoholic mediums. It is established that surface-active substances (cetyltrimethylammonium chloride, cetylpyridinium chloride, sodium dodecyl sulfate, triton X-100, tween-80), and also donor-active agents (1,10-phenanthroline, 2,2'-dipyridyl, triphenylphosphine oxide, trioctylphosphine oxide, β-cyclodextrin) don't influence intensity of the luminescence of a complex, or reduce it. Possibility of direct luminescent determination of α-bitter hop acids in hop extracts on a sensitized luminescence of an ion of Tb(III) is shown. The detection limit of α-bitter acids in extracts of hop makes 0.003 mkg/ml.

Keywords: α-bitter acids of hops, sensitized luminescence of Tb(III) ion