

Chemical Sciences and Advanced Chromatography 2019: Development and validation of a spectrophotometric method of α -Lipoic acid in dietary supplements - Spyridon Papageorgiou - Greece National and Kapodistrian University of Athens

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α -Lipoic acid (α -LPA), 1,2-dithiolane-3-pentanoic acid, is an universal antioxidant present in prokaryotic and eukaryotic cells. It acts as a cofactor in different multi-enzyme complexes. It plays an important role in the synergism of antioxidants by directly recycling vitamin C, glutathione and coenzyme Q10 and indirectly recycling vitamin E. Due to its unique properties, it has also been administrated in both prevention and treatment of various oxidative stress related diseases such as alcoholic liver disease, heavy metal poisoning, diabetes, glaucoma, ischemia/ reperfusion injury of heart and neurodegenerative disorder. A simple, sensitive and rapid analytical method for the determination of α -Lipoic acid in dietary supplements in capsule dosage form based on reverse phase high performance liquid chromatography with UV detector at 340 nm was developed. The determination was performed on a Luna C18 analytical column (150 x 4.6mm i.d., 5 μ m) ; the mobile phase consisted of 0.05 M KH₂PO₄ (pH 4.5) mixed in acetonitrile in a ratio (60:40, v/v) and pumped at a flow rate 1.00 ml min⁻¹. The retention time of α -Lipoic acid was 8.5 min. The method was validated for parameters like linearity, precision, accuracy, stability, specificity and ruggedness, as per ICH norms. Calibration graphs are linear in the concentration range of 5-30 μ g/ml, while the correlation coefficient was at 0.999, 0.998 and 0.999 respectively. The intra- and inter day R.S.D values were less than 1.9 %, while the relative percentage error Er was less than 4.1%. LOD and LOQ was found 1.26 μ g/ml and 3.83 μ g/ml respectively. This method is found suitable for rapid and reliable control of α -Lipoic acid dietary supplement in capsule form.

Recent Publications:

1. Papageorgiou S, Varvaresou A, E. Tsirivas E, Demetzos C (2010) New alternatives to cosmetics preservation. *Journal of Cosmetic Science*. 61: 107-123.
2. Varvaresou A, Papageorgiou S (2011) The development of self-preserving gels (2011) *Household and Personal Care Today*: 18-21.
3. Papagianni P, Varvaresou A, Papageorgiou S, Panderi I (2011) Development and validation of an ion-pair RPHPLC method for the determination of oligopeptide-20 in cosmeceuticals
4. *Journal of Pharmaceutical and Biomedical Analysis* 56:645-649.
5. Varvaresou A, Papageorgiou S, Protopapa E, Katsarou A (2011) Efficacy and tolerance study of an oligopeptide with potential anti-aging activity. *Journal of cosmetics, dermatological sciences and applications* 1:133-140
6. Kalogria E, Varvaresou A, Papageorgiou S, Protopapa E, Tsaknis I, Matikas A, Panderi I (2014) Pre-Column Derivatization HPLC Procedure for the Quantitation of Aluminium Chlorohydrate in Antiperspirant Creams Using Quercetin as Chromogenic Reagent. *Chromatographia* 77:1275–1281.
7. Varvaresou A, Papageorgiou S, Mellou F, Protopapa E (2016) Study in anti-wrinkle activity of a night cream containing a combination of antioxidants, phyto-steroids and acetyl-tetrapeptide-9 by biophysical methods and objective evaluation *Review of Clinical Pharmacology and Pharmacokinetics, International Edition* 30:67-70.