
Separation and analysis of Ni(II), Co(II), Pb(II) & Zn(II): Capillary zone Electrophoresis Technique

S. Kanchi, N. Venkatasubba Naidu*

**Department of Chemistry, Sri Venkateswara Univeristy, Tirupati- 517 502, A.P.,INDIA*

Abstract

During the past decade, capillary electrophoresis (CE) emerged as a promising, effective and economic approach for the separation of a large variety of substances viz, organic and inorganic materials. The CE technique is becoming a viable alternative to ion chromatography (IC) and high performance chromatography (HPLC) for the determination of inorganic in food, in this area of analysis. Due to this reason, there is a necessity in the development of rapid, facile and selective pre-capillary complexation method for the simultaneous determination of Ni(II), Co(II), Pb(II) & Zn(II) by employing capillary zone electrophoresis(CZE) with UV light as a detector. The method is based on complexation of metal ions with ammonium morpholine-4-carbodithioate (AMC) at pH 7.2 in phosphate buffer medium. Various parameters such as pH effect of the solution, concentration of ammonium morpholine-4-carbodithioate, applied voltage, nature of the buffer solution and interfering ions were also studied to enhance the selectivity and sensitivity of the present method. Pre-capillary complexation-CZE method is easier to handle, cost effective, less contamination of sample when compared to post capillary complexation-CZE method. The developed method allows the determination of metal ions in less than 5 min with a good agreeable recoveries ranging from 93.50 % to 100.00 %. The limit of detection(LOD) for Ni(II), Co(II), Pb(II) and Zn(II) is calculated three signals to noise ratio and are found to be 2.36×10^{-8} M, 4.20×10^{-8} M, 1.95×10^{-8} M and 3.39×10^{-8} M respectively. This method was successfully applied to the determination of Ni(II), Co(II), Pb(II) & Zn(II) in various vegetable samples with good agreeable results.

Keywords: Capillary zone electrophoresis(CZE), Ammonium Morpholine-4-Carbodithioate (AMC), Phosphate buffer, Ni(II), Co(II), Pb(II), Zn(II), Vegetable samples

*Author for Correspondence: nvsn69@gmail.com