Nickel is a moderately toxic element compared to other transition metals. It is known that inhalation of nickel and its compounds can lead to serious problems, including respiratory system cancer. Moreover, nickel can cause a disorder known as nickel-eczema. Other studies show a disease, characterised as occupational disease, increased in patients who consume food and beverage rich in nickel. Environmental pollution monitoring requires determination of trace nickel in various samples [1].

In this study, a sensitive and simple method for microsample injection flame atomic absorption spectrometric (MIS-FAAS) determination of trace nickel after preconcentration by dispersive liquid-liquid microextraction (DLLME) was developed. In the proposed DLLME, 8-hydroxyquinoline was used as a complexing reagent. Plackett-Burman and Full Factorial designs of MINITAB statistical program were used to optimize the method. The accuracy of the method was controlled with industrial waste water standard reference material (BCR 715). The recovery of nickel was found to be 98.3 % and relative standard deviation was 1.67%. The detection limit was calculated as 1.04 µg L⁻¹. The proposed method was applied to determination of trace nickel in various water samples and wire sample with satisfactory results.

KEYWORDS: nickel, dispersive liquid-liquid microextraction, 8-hydroxyquinoline, microsample injection FAAS, water samples

REFERENCE: