Green chemistry approach: flow-based system and bioreagent for water quality control
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Abstract: Recently, the development in green analytical techniques or procedures that provide economical and environmentally friendly advantages has become an important aspect in sustainable analytical chemistry. The replacement of toxic chemicals with alternative less-harmful reagents utilization of natural compounds in plants and the minimization of waste production using flow-based analysis techniques are a way to achieve greener analytical methods. This work presents the use of plant extract from Ma-kham-pom as a bioreagent from plant extract in conjunction with flow-based analytical systems for determination of iron(III) in water samples. The proposed method was based on the complex formation between plant extract and iron(III) to form dark-purple coloured product in acetate buffer pH 5.6 which has maximum absorption wavelength at 570 nm. The linear calibration graph under the optimum conditions was obtained in the range of 0.50-20.0 mg L⁻¹ iron(III) with throughput of 90 samples h⁻¹. The proposed method is simple, inexpensive and low chemical consumption, which is considered to be a green analytical technique and environmentally friendly technique for water quality control.

Keywords: Green chemistry; Flow-based system; Bioreagent; Iron(III); Water samples