Industrial-Scale Sequential Injection Analysis Method for Pindolol

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An inexpensive, rapid, safe and green method for pindolol assay in medicines was developed using sequential injection analysis (SIA) technique [1-3]. The method was based on the oxidation of pindolol by dichromate in sulfuric acid media. A chromogenic form of pindolol was spectrophotometrically detected at 640 nm. The 3^3 full-factorial design approach was applied to optimize acid concentration, pindolol volume and reaction time [4]. The automation of SIA and the optimization process offered satisfactorily selectivity to the method. The recovery of pindolol in the presence of clopamide as a companion drug, besides excipients usually found in tablet formulation, was in the range of 96.5 - 98.4%. The automation also provided good repeatability, with a relative standard deviation value of 2.17% for seven replicates. Additionally, the miniaturization of SIA rendered the method reagent-saving (the total consumed reagent volumes was 120 μL) and environmentally-friendly (the total waste volume was 1320 μL). Furthermore, both the automation and miniaturization offered a rapid procedure (the sample frequency was 22 samples/h). On the other hand, the chemometric optimization improved the detectability of the method with the limits of detection and quantification of 0.57 and 1.90 μg/mL, respectively. Eventually, the proposed SIA method fulfills the requirements of modern industrial-scale analysis for the purpose of quality control.

Schematic diagram of a SIA manifold constructed for pindolol assay

REFERENCES