

## Sequential flow injection analysis with potentiometric detection for the determination of ammonium and urea in human saliva

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In this work, a sequential injection (SI) system for the simultaneous determination of ammonium and urea is described. An ammonia ion selective electrode (ISE) was used for potentiometric detection of ammonium. The determination of urea was based on enzymatic hydrolysis using urease to convert urea to ammonium. The urease enzyme was immobilized and packed in a mini-column (E) connected to the selection valve, as shown in Fig.1. After conversion, the stream of the ammonium plug merged with a sodium hydroxide solution to form molecular ammonia and to act as ionic strength adjuster (ISA). The produced ammonia was propelled to the ammonia ISE enabling to determine urea concentration. For ammonium determination, standard solutions were aspirated and propelled to the confluence point to merge with ISA hydroxide solution before reaching the ammonia ISE. This SI method could be useful for fast and sensitive detection to quantify salivary ammonium and urea in patients with some oral or chronic kidney disease.

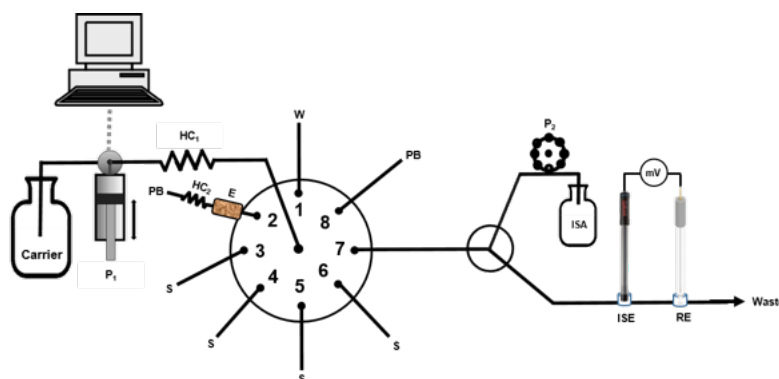


Fig. 1 SI manifold for the determination of urea in human saliva. P<sub>1</sub>, syringe pump; P<sub>2</sub>, peristaltic pump; HC<sub>1</sub> and HC<sub>2</sub>, holding coil; E, urease enzymatic reactor; Carrier, deionized water; ISA, 0.2 M NaOH; PB, phosphate buffer (pH 7); S, standard solution or sample; ISE, ammonia ion selective electrode; RE, reference electrode; mV, potentiometer; W, waste.

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