E2-65: Development of a low cost flow injection analysis system

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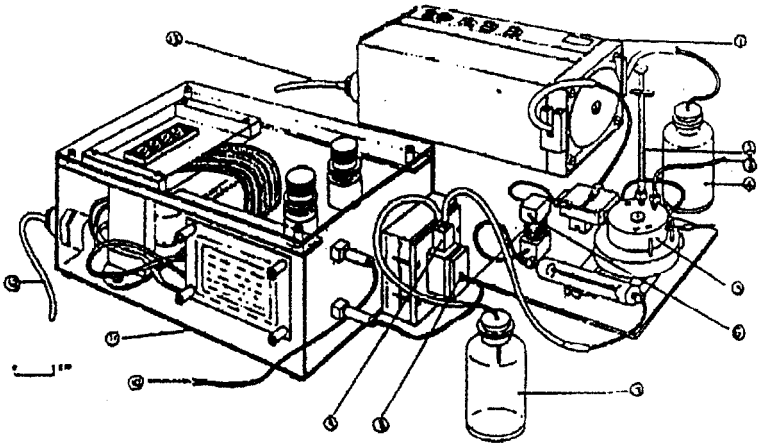
The increasing demand for clinical, agricultural, pharmaceutical, industrial analysis has led to the development of a large number of different instruments for automated analysis. Automated systems have additional advantages such as increased precision, decreased cost of individual assays, application of large number of samples with minimum expense of labour and small amounts of waste. A programme was been initiated in our laboratory to adopt low-cost automated methods for chemical analysis.

Flow injection analysis is performed by introducing a sample into a carrier stream having necessary reagents to form a coloured species. If such an instrument is constructed at an affordable price, it can be used in laboratories, especially in third world countries such as Sri Lanka.

Flow injection analyzer was constructed using locally available components. Main parts of this instrument are: reagent reservoir, injection port, mixing coil, and the detector. The detector consists of log converter, power supply unit cell compartment, digital readout device and the detector compartment. To monitor the variation of the response, the output signal is connected to a simple chart recorder. The developed equipment can be applied for trace level analysis.

The performance of the locally developed flow injection analyser was monitored using standard coloured solutions. The influence of the sample volume on dispersion was almost similar to the standard conditions, i.e., injection sample is reciprocally proportional to the dispersion. The peak height increases with the injected sample volume within the medium dispersion range that is used o determine the concentration analytes. The influence of tube length on dispersion was also similar to the standard, i. e. dispersion increases with tube length.



1. Peristaltic pump
2. Syringe
3. Waste tube (2)
4. Carrier solution reservoir
5. Injection port
6. Mixing coil
7. Waste bottle
8. *LED*
9. Flow through cuvette
10. Connection of chart recorder
11. Detector perspex box
12. Power code for the detector system
13. Power code for the pump

The developed *FIA* system.