

FLOW INJECTION ANALYSIS IN CHINA

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The beginning of the development of flow injection analysis (FIA) in China dates back to 1977 when the Author and his colleagues curiously conducted their first experiments on FIA using hypodermic syringes and a septum type injection port following the early design of Ruzicka and Hansen in their first paper on FIA (1). Preliminary results were so encouraging the technique and hardware were rapidly improved and two years later the determination of nitrogen and phosphate in soils were run with FIA systems on a routine basis in the soil chemical laboratories of the Institute of Forestry & Soil Science. The first Chinese publication on FIA appeared in 1979 with special emphasis on the automation of soil chemical analysis (2); this was followed by a roughly exponential increase in the number of publications in this field (Figure 1). Using a logarithmic scale for the cumulative number of FIA publications by Chinese authors, its growth curve plotted as a function of time shows a slope pattern similar to that plotted for the international FIA literature (3). The two curves are almost parallel, with the number of Chinese contributions always making up approximately 8 % of the world total since 1981. In the recent few years the doubling time T_d of the curve increased from the earlier 1.0 to a value of 1.4 years, this rate of development will probably be kept on for a considerable period as the interest in FIA is now growing steadily in China.

A study on the distribution of the different fields of application of FIA in China revealed that 35 % of the total is dedicated to agricultural and environmental sciences. This is quite natural, as FIA is no doubt a powerful tool in exploring China's vast territories and resources. On the other hand, clinical and pharmaceutical applications which constitute a considerable per-

centage of applications in the international literature are very few in China. Owing to China's large population, applications of FIA in these fields are expected to increase rapidly. The large percentage (27 %) of reviews and the lack of theoretical investigations may suggest that the development of FIA in China is yet in a preliminary stage.

The detector used most often for FIA systems in China is the spectrophotometer followed by atomic absorption and electrochemical detectors. This is in accordance with the international situation (3); however, recent trends show a gradual increase in the percentage of applications with FIA-AAS and FIA-ICPAES.

In the earlier days of development FIA equipment used by Chinese workers (including pumps and flowcells) were mostly imported. This has changed gradually with large improvements in the quality of locally produced products and presently more than five companies are involved in the production of FIA and related equipment.

As mentioned previously, in general, the development of FIA in China should be considered to be still in a preliminary stage, yet the potentials for future developments are large. The interests generated in this area are so broad and intense that a FIA organization - the " Chinese Association for the Promotion of Flow Injection Analysis " was founded in 1986, which has now over 300 members. The First National Conference on Flow Injection Analysis held in Shenyang earlier this year was attended by over 120 participants, and had 53 papers presented. The ever increasing demand for more and better analytical information in such a large developing country as China will provide an extremely strong impetus for the development of FIA. It is reasonable to expect that FIA will have a great future in China.

REFERENCES

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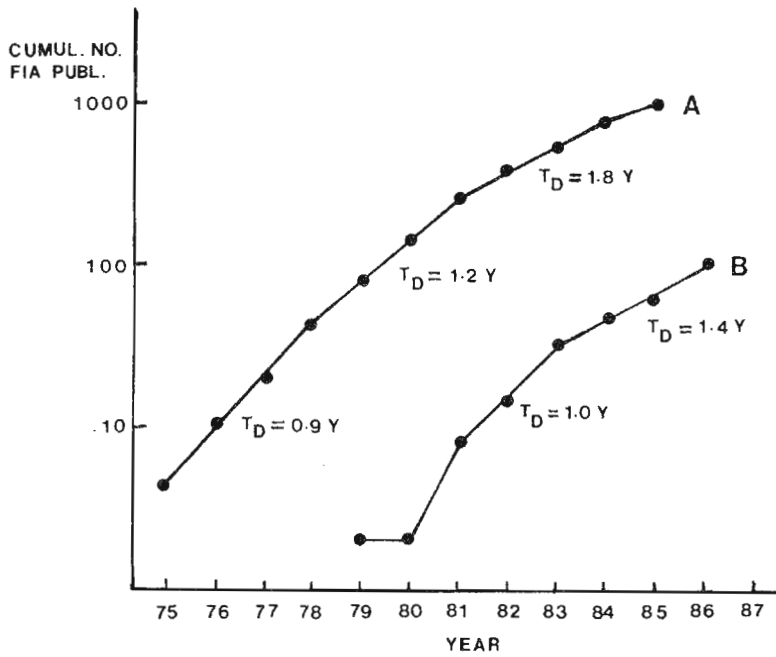


Figure 1. Growth of international publications (3) and Chinese publications on FIA. A, international; B, Chinese.