

Stahl E. Thin-layer chromatography. II: standardization, visualization, documentation, and application. *Chem. Ztg.* **82**:323-9, 1958.  
[Dept. Pharmacy, Johannes Gutenberg Univ., Mainz, Fed. Rep. Germany]

**Production and use of thin layers with standard silica gel G are described. Substances are made visible with the help of aggressive spray reagents and by heating on these 'open columns,' and consequently, adsorption chromatographic separations and detection of numerous chemical substance mixtures in the microgram range are possible. [The SC]<sup>®</sup> indicates that this paper has been cited over 430 times since 1961.]**

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"The first publication titled 'Thin-layer chromatography (TLC)' appeared in 1956, but, alas, it remained as unnoticed as the works of my predecessors.<sup>1</sup> No denying, I was disheartened as I had experimented with this method since 1950 in order to be able to identify the contents of plant glandular trichomes (approx. 0, 05 to 0, 1µg!). In 1955, I finally succeeded on very fine grained, 20 µm thin layers of silica gel.

"Now, this happened to be the prime of paper chromatography (PC) and everyone tried to solve all separation problems by PC. Working at that time at the pharmaceutical department of the University of Mainz, I can still hear my boss say: 'Leave this fooling around with thin layers be, do work on more important problems!' He did change his mind, though, when I succeeded to separate with my method secalca alka-loids in which he was highly interested. In numerous further tests, the advantages of TLC to PC became apparent. Before trying my luck in a second publication, I was looking for the reasons why the method so far had not found recognition. The following appeared necessary: 1) Rationalised preparation of the thin layers. 2) Combination of all necessary equipment in a basic kit. 3) Industrial production of all TLC-applicable adsorbents. 4) Ascertaining the controlling factors and standardisation of

the procedure. 5) Establishment of the scope of the method and demonstration of interesting separations.

"By 1958, my efforts had made so much progress that I could report in a second communication in the *Chemiker-Zeitung*; a paper, which only a short time before, had been rejected by the largest German chemical journal. Now, together with the basic kit and the industrially manufactured silica gel for TLC it hit the news in time for AICHEM 1958, the most important European exhibition of the chemical world. The interest soared, and so did the international requests for reprints. This was motive enough for me to do further research with the yield of more publications —65 of them —concerning the further development of the method.<sup>2</sup>

"Today, we know that on account of this publication and the following work, PC lost its fame and TLC took its place. The high separation power of TLC was the reason, too, for the newly starting research in the classical Tswett's column chromatography which initiated HPLC. The now fashionable use of the term 'HP' in TLC, however, to me seems of little ingenuity as 'HP-separations' of nanogram amounts were described by us almost two decades earlier.

"Last but not least, by its publication in 1958, thin-layer chromatography had become the most often used separation procedure in the world with daily separations of tens of thousands of mixtures and the controlling of substance purities. The then statements that 'TLC facilitates solving problems fast and without expensive investment in time and material and that it should become an asset in research and production' became true and awards are plentiful:

1966, Fresenius award of the German Chemical Society; 1967, Talanta Gold Medal; 1967, Schunk Award of the University of Giessen; 1971, Fluckiger Gold Medal; 1973, Kolthoff Gold Medal of the American Pharmaceutical Association; 1973, Dr. Med. Honoris Causa of the University of Leuven, Belgium; 1975, ACS Award in Chromatography; 1977, Mannich Medal of the German Pharmaceutical Society; 1978, Tswett Medal of the USSR."

1. Stahl E. Thin-layer chromatography. *Pharmazie* **11**:633-7, 1956.

2. Twenty years of thin-layer chromatography, a report on work with observations on future prospects. *J. Chromatography* **165**:59-73, 1979.