## Abstract

An analytical technique to combine TLC with MS was developed. The initial study was carried out on a graphite plate, which functions as a photon absorbing material. A continuous wave diode laser replaced traditional pulsed lasers as the desorption source, which was employed for this purpose for the first time. The thermally desorbed analyte molecules are ionized in the gas phase by a corona discharge device at atmospheric pressure and detected subsequently by a mass spectrometer, by which both essential processes — the desorption and the ionization of analyte molecules, which are often performed in one step - are separated. The technique was subsequently applied to thin-layer chromatography (TLC) to realize the combination of TLC and mass spectrometry. A graphite suspension was employed to couple the laser energy and improve the desorption efficiency. In this case, the necessary power density for desorption was decreased by two orders of magnitude. In addition, a TLC plate-scanning device was developed, by which the chromatography on a TLC plate can be recovered, and rapid screening for numerous analytes on a TLC plate can be achieved. The device can also be applied for the identification of unknown compounds or to recognize overlapping sample spots. Finally, a quantification method for this system was developed. An internal standard was added into the mobile phase to yield a ‘background’ signal, which was used as a reference signal for the quantification. In this way, a wide range of compounds can be chosen for this purpose.