AMBIENT IONIZATION MASS SPECTROMETRY: TEN YEARS AFTER INTRODUCING DART AND DESI

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In 2015 we are celebrating the 10th anniversary of the two most important techniques from the group of ambient ionization mass spectrometry namely of desorption electrospray (DESI) [1] and direct analysis in real time (DART) [2] which were mentioned for the first time in 2004 and 2005 respectively. In the following years a series of new ionization techniques falling into this sub-group have been developed. Besides DESI with its combined desorption and ionization mechanism and DART, based on the interaction of excited gas molecules (mostly helium) either directly with the analyte or via ionization of solvent molecules with subsequent proton transfer, direct ionization methods have gained increasing interest over the last years [3]. Hereby an ESI process is generated directly from a solid substrate. These direct ionization methods comprise techniques like paper spray -, tissue spray -, wooden tip spray, and thin layer spray mass spectrometry. Thereby direct s pray methods (mostly from solid-substrate ESI methods) show several distinct advantages, including extremely low sample preparation effort, the possibility to directly analyze trace amounts of substances deposited on surfaces without additional extraction step, the avoidance of any clogging problems often encountered in capillary based ESI and the wide range of materials suitable for direct ionization analysis. Not to forget, direct ionization methods can also be seen as a low-cost option to obtain MS spectra from a variety of specimens.

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