Ambient ionization source based on a dielectric barrier discharge for direct testing of pharmaceuticals using ion mobility spectrometry

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Author(s) Chantipmanee, Nattapong; Furter, Jasmine S.; Hauser, Peter C.
Author(s) at UniBasel Hauser, Peter C. ;
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The instrument is based on a miniature plasma source mounted at an oblique angle close to the injection gate of the ion mobility spectrometer. The plasma torch consists of two 5 mm wide external cylindrical electrodes, 10 mm apart, which are placed coaxially around a fused silica tube (1.5 mm i.d. and 3.0 mm o.d.). A small helium plasma is created by applying a alternating voltage of 8 kV at 28 kHz and employed for the direct desorption and ionization of solid or liquid samples, which are placed on an electrically isolated support. The separation section of the ion mobility spectrometer has a drift tube of 10 cm length and an applied high voltage of 4 kV. The instrument was built in-house at low cost and can easily be duplicated. Its usefulness was demonstrated by the rapid identification of five different pharmaceutical drugs, namely acetaminophen, loratadine, norfloxacin, tadalafil, thiamine as well as caffeine in ground coffee beans.
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