

# Investigation of nitrogen-containing heterocycles by ion mobility spectrometry

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Ion mobility spectrometry is a modern method for analyzing chemical compounds in the gas phase [1], [2]. The method is promising for solving a wide range of analytical problems because of its speed, high sensitivity, lack of vacuum systems, and portability. Nitrogen-containing heterocycles play an important role in the pharmaceutical industry, agriculture and veterinary medicine. Research work was carried out to analyze the characteristic signals of pyridine, imidazole and N-methylimidazole by ion mobility spectrometry on the ion-drift detector “Kerber-T”.

The features of the change in the nature of the ion mobility spectrum in the process of measurement are studied. The signal of an ion protonated at the pyridine nitrogen atom corresponds to an ion mobility of  $2.1 \text{ cm}^2/(\text{V}\cdot\text{s})$ . It can serve as a characteristic signal for identifying the pyridine nitrogen atom in the molecule. The second signal corresponds to the dimer ion. The stability of dimer ions and the detection limits of compounds differ. The dimer ion is more stable for imidazole.

The detection limits for imidazole and N-methylimidazole were determined to be 0.3 ng and 0.3 pg, respectively.

- [1] Eiceman G, Kapras Z and Hill H H 2014 *Ion Mobility Spectrometry* (Boca Raton: CRC)
- [2] Borsdorf H and Eiceman G 2006 *Appl. Spectrosc. Rev.* **41** 323–375