chemisch
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Gegründet im Jahre 1869 von H. Hlasiwetz, J. Loschmidt, J. Petzval und J. Stefan

EINLADUNG

zum

CPG Vortrag von

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Gas-phase electrophoresis applying a nES GEMMA instrumentation - can it help in vaccine development?

am

Dienstag, 15.Juni 2021, um 17:30

Zoom-Meeting beitreten:

https://tuwien.zoom.us/j/98941402239?pwd=bnc0Vi9nb09hNmVLVk0xNmNiTTV4Zz09

Meeting-ID: 989 4140 2239 Passwort: q1k2NRDu

Abstract

Gas-phase electrophoresis applying a nano Electrospray Gas-phase Electrophoretic Mobility Molecular Analyzer (nES GEMMA) instrument will be discussed. Analytes are electrosprayed from a volatile electrolyte solution followed by particle drying and charge-equilibration. This latter step results in mostly neutral yet also a considerable amount of single-charged, dry particles. Subsequently, analytes are separated in the nano Differential Mobility Analyzer (nDMA) part of the nES GEMMA by voltage scanning in a tunable electric field and an orthogonal high sheath flow of particle-free air. As particles are single-charged (neutral species are not regarded), separation of analytes is solely based on their dry particle electrophoretic mobility (EM) diameter. Furthermore, in good accordance with a recommendation of the European Commission for nanoparticle research (2011/696/EU from October 18th, 2011), particle detection is based on the number of particles. Beginning with proteins and protein aggregates nES GEMMA has yielded valuable insights regarding sample purity, analyte stability and aggregational behavior as well as dry particle sizes. Given that a correlation based on molecular weight and EM diameter of well-defined standards can be set up, even the molecular weight of an analyte can be assessed from its EM diameter as first demonstrated for proteins and recently even for intact viruses and virus-like particles. Likewise, liposomes have been measured via gas-phase electrophoresis. Besides the measurement of dry particle size values, the determination of size distributions and the estimation of particle concentrations, analytes of a certain and well-defined size (depending on a fixed applied voltage inside the nDMA) can be collected on various surfaces for orthogonal analyses, for instance atomic force microscopy (AFM), spectroscopic or mass spectrometric measurements. To conclude, nES GEMMA yields valuable insights regarding (bio-)nanoparticle containing samples and can definitely help in vaccine development.