

Capillary electrophoresis successfully used for steam and boiler water analysis

Instrument
Capillary electrophoresis system Capel-205

Industry
Power plants

Company
GESTRA AG

Region
Europe, Germany

GESTRA AG, a global leader in the design and production of valves and control systems for heat and process fluid control decides to implement capillary electrophoresis (CE) to conduct fast and accurate analyses of steam and boiler water samples.

THE CHALLENGE

GESTRA AG produces valves and control systems for steam machines on heat generation plants including electrical power stations. Water used for a steam generation (“feedwater” and “boiler water”) must be of a certain quality to avoid boiler and pipes corrosion and prevent any kind of deposition. Improper water quality affects the system and can destroy the functionality of the entire facility, despite the steam generation’s high-quality materials and assembly. Moreover, condensed steam and a new portion of water, prepared for the second and following cycles in steam machines also must be checked and purified from certain cations and the excess of oxygen. The general requirements for feed- and boiler water quality in the EU are summarized in European Norm EN 12952-12:2003. Besides the parameters stated in this norm, more compounds (mainly inorganic cations and amines) must be regularly determined in water for the research and technological control purposes.

THE SOLUTION

For feed- and boiler water testing, we suggested the capillary electrophoresis (CE) method. CE system **Capel-205** with the analytical methods developed by Lumex Instruments enables determination of different [inorganic anions](#), [inorganic cations](#), and some amines in water samples. These methods are offered in the form of kits which contain all necessary buffer solutions, the standard solutions, and relevant protocol as SOP.

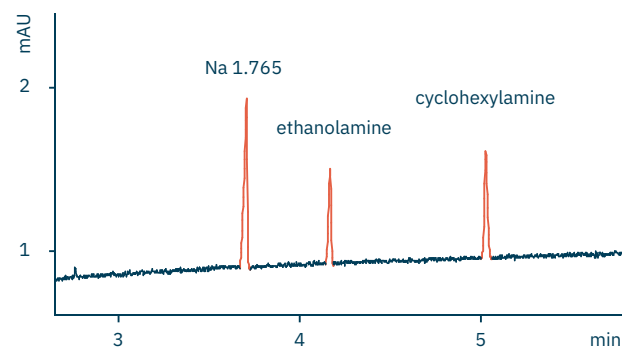
Capillary electrophoresis turned out to be an excellent choice for GESTRA. An important advantage of Capel-205 is the ability to switch quickly between different anion and cation protocols on the same instrument just by using different cassettes and different pre-composed files. One sample of fewer than 0.5 mL is enough to determine the entire composition of cations or anions present. Together with an extended autosampler capacity up to 59 positions and simple sample preparation (only filtration and degassing), the process of technological control becomes faster and easier.

THE RESULTS

Most water samples analyses performed in GESTRA AG so far using Capel-205 demonstrated how well CE fits the requirements of feed- and boiler water testing. During the installation, the customer emphasized the simultaneous determination of both cations and amines in one run in a very short time as a special advantage.

The unique combination of accuracy, simplicity, and fast analysis time was the main reason for GESTRA AG to purchase Capel-205 and start implementing the CE method in its chemical lab.

Determination of cations in feedwater



Determination of cations in boiler water

