CIPAC MT STATUS REPORT

28/10/2015

MT 199 Quaternary ammonium compounds

Allocated to AOAC

CIPAC methods published in:

Not published

CIPAC 58th meeting, June 2014 in Liège

Quaternary ammonium compounds by Ms Diane Rains (4965, 4966)

Ms Rains presented the results of a **full scale** collaborative study on the determination of quaternary ammonium compounds by titration using an ionic surfactant electrode.
Quaternary ammonium compounds (quats) is the general term used for compounds that consist of saturated alkyl groups attached to a nitrogen atom associated with an anionic species (e.g., chloride or bromide). They are used in many disinfectant products. Originally a collaborative study was designed to be conducted within AOAC International; however due to changes in the structure of AOAC International the study was moved to CIPAC.
The method measures the quaternary ammonium compounds as total quaternaries and is suitable for concentrated and ready-to-use (RTU) disinfectant formulations. The method is not suitable for products containing large amounts of alcohol (methanol, ethanol, isopropanol, etc.) and/or hydrochloric acid.
A potentiometric titration, utilising an ionic surfactant electrode and a titrant of sodium lauryl sulfate, is used to determine the amount of quaternary nitrogen in the sample. As the method uses a specific electrode, these were supplied to the laboratories.
19 laboratories offered to participate in the collaborative study and samples were shipped to 14 laboratories. There were issues with sending samples to Romania and China. 12 laboratories returned a full set of results within the deadline for submission. 7 samples of detergents were sent to participants. These covered a range of concentrations and active substances (different quats).
One laboratory reported some precipitate for one sample and another sample appeared to be cloudy/hazy. The precipitate was mixed before sub-sampling. The cloudy sample was analysed using a smaller sample size which reduced the initial "bumpiness" observed in the early titration curve.
One laboratory recommended more conditioning of the electrode prior to use. It was recommended to include three "throw away" titrations for a new electrode and for electrodes that had not been used in more than a month. Unconditioned electrodes will give higher RSDs (>5%) indicating the need to condition further
The statistical evaluation was carried out according to the CIPAC guidelines. For Sample C lab 6 was identified as a Grubb's outlier.
No other outliers were identified. All results were initially included in the evaluation.
In the initial evaluation the Horwitz criteria were met for all samples.
Ms Rains concluded that the method is suitable and proposed the method be adopted as provisional by CIPAC

No comments were received from the meeting.

Decisions: The potentiometric titration method utilizing an ionic surfactant electrode (CIPAC/ 4965) for the determination of quaternary ammonium compounds in concentrated and ready-to-use (RTU) disinfectant formulations was accepted as a **provisional** CIPAC method.

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CIPAC 59th meeting, June 2015 in Athens

At the 58th meeting, 2014 in Liège the method was accepted as provisional. No further comments were received. The final MT number will follow in due time.

Decision: The method can be promoted to a **full CIPAC method**.