

Examination and evaluation of the measuring system Krypton K Ozon – monitoring of ozone concentration in drinking water

Abridged version of the evaluation report dating Mar. 31, 2008

The measuring system Krypton K Ozon by the Dr. A. Kuntze GmbH, Meerbusch (Germany), was examined and evaluated at IWW Water Centre, Muelheim (Germany) regarding its applicability for monitoring ozone concentrations in drinking water. The respective online measuring system measures ozone by an amperometric approach.

For the examination and evaluation, the requirements of the German Drinking Water Regulation 2001 and of the standard method EN ISO 15839 (Online sensors/analysing equipment for water – specifications and performance tests) were taken into account.

- The calibration function of the Krypton K's analysis method was found to be linear over the whole application range (0.05-1.0 mg/l).
- The limit of quantification (LOQ) was found to be 0.1 mg/l O₃, and the limit of detection (LOD) 0.03 mg/l.
- The accuracy of the mean was found to be very good over the whole application range as well as in the lower part of the measuring range. The recovery rate in the lower part of the application range at 0.2 mg/l was 108% (0,216 mg/l).
- The precision of the method was found to be very good even in the lower part of the application range, with 4.8% or 0.2 +/- 0.010 mg/l within-batch precision and 7.7% or 0.2 +/- 0.016 mg/l between-batch precision over a period of five days.
- The response time of the analysis method – 28 seconds for positive changes and 20 seconds for negative changes – was found to be very good.

The accuracy of the means and the precision of the method were found to be very good.

The method's limit of detection of 0.03 mg/l ozone is suited to detect the ozone concentration at the limit value of the German Drinking Water Regulation 2001 (0.05 mg/l).

However, the method's limit of quantification (0.1 mg/l) which is for statistical reason better suited for analytical quantification is higher than the limit value (0.05 mg/l).

This means in practise that Krypton K Ozon is well suited to control the dosage of higher ozone concentrations during drinking water treatment. Furthermore, ozone concentrations at the limit value can be monitored. When monitoring ozone concentration close to the limit value, the measuring system should be checked periodically by using a standard reference method (e.g. EN ISO 7393-2).

This evaluation is based on the method performance characteristics linearity, limit of quantification, accuracy of the mean, precision, and response time, as determined under laboratory conditions.

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Dr. U. Borchers

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Dr. A. Rübel