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Salt-Mist-Test

Adjustment and Stabilization of pH-Value of NaCl-Brine

For brine which has been composed of NaCl (a.g.) and our de-ionized water (conductivity $< 0.1 \mu\text{S}/\text{cm}$) with NaCl-concentration 50 g/l we find pH-values around 6. The brine gets more acid (down to 5.5 and even below) by absorbing CO_2 from air.

The standard ISO 9227 for the NSS-test defines the range for pH-value from 6.5 to 7.2 and demands an adjustment of pH-level by adding NaOH-solution in case of acid brine.

Doing so, we found, that the pH-value is not stable (diagram). After one hour the pH-value leaves the allowed range and decreases down to 6.0 within one day. Because NaOH in aqueous solution is a strong base (fully dissoziated) it has no buffer capacity to compensate additional absorbed CO_2 during spraying or within the storage container of the salt-mist-equipment.

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With anticipation of absorption of CO_2 we had slight success, but pH-value also does not stay within the allowed range.

Therefore we decided to use NaHCO_3 (in aqueous solution a weak base) for correction of the acid brine. With that chemical no new chemical elements/compounds are added or formed in the brine.

The buffer capacity of NaHCO_3 is high enough to stabilize the brine at a slight alkaline/neutral pH-level for a test duration of 96 hours and even longer (diagram).

With the new methode we have the pre-condition to fulfil the requirement for pH-value of the sprayed brine collected within the test cabinet. This was proven in several test runs.

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