

Application Note MQuant® StripScan – pH in Soil

Smartphone-based determination of pH after reaction with a chemically bound pH indicator

Introduction

Analyze your MQuant® test strips with your smartphone for fast, convenient, and precise results. Test the simplest way to determine pH in aqueous solutions. This low-priced and easy-to-use analytical detection system provides reliable quantification of water, food & beverage samples for customers from research, industry, environment and diagnostics.

The following application note describes the determination of the pH value in soil samples using the MQuant® pH test strips in combination with the MQuant® StripScan App



Experimental conditions

Method

Special indicator dyes are covalently bound to the reagent papers, which changes the color depending on the pH value of the sample.

Sample material

Soil samples

Measuring range

pH 0–14

Reagents

Catalog No. 109535 **MQuant® pH-indicator strips pH 0 - 14 Universal indicator**

Catalog No. 103736 **MQuant® StripScan Reference Card** for analyzing MQuant® pH indicator strips pH 0–14

Catalog No. 102382 **Calcium chloride dihydrate for analysis**

Catalog No. 116754 **Water for analysis or distilled water**

Accessories

MQuant® StripScan App (can be downloaded via the IOS Appstore)

Analytical approach

Preparing the reagents

0.0125 M CaCl₂-solution

Dissolve 0.919 g calcium chloride dihydrate in water for analysis and make up to 500 ml with water for analysis in a volumetric flask.

Sample preparation

Homogenize 10 g of soil sample (exactly weighed) with 25 ml of 0.0125 M CaCl₂-solution by shaking for 15 minutes.

Measurement

For analysis, follow this procedure:

1. Start the App.
2. Dip the test strip into the soil slurry (15 - 25 °C) for 10 minutes, ensuring that the reaction zone is completely immersed.
3. Then remove the strip from the suspension and quickly rinse the reaction zones with distilled water to remove particles.
4. Shake off excess liquid from the strip and dry the backside of the strip using a paper towel.
5. Select the parameter pH (109535) in the app. Wait 15 seconds until the color of the pH strip has completely developed (a countdown is displayed on the screen, which begins immediately after selecting the parameter pH).
6. Just before the end of the countdown, place the test strip on the Reference Card.
7. After the waiting time is elapsed, place the Reference Card with the test strip within the viewfinder on your phone screen, and align the camera along the reference points.
8. The picture is captured automatically by the camera of the smartphone.
9. The result is displayed on the screen.

Results

Table 1. Comparison with visual evaluation, **Reflectoquant® pH test** (Catalog No. 116996), and pH electrode (acc. to DIN EN 15933:2012-11):

Sample	pH Value			
	StripScan*	visual readout*	Reflectoquant®*	pH electrode
1	6.3	7	6.9	6.88
2	5.0	6	5.3	5.68
3	6.0	7	6.8	6.71
4	6.6	7	7.2	7.30
5	6.0	7	6.8	6.78

*Results are based on the average of a 5-fold determination (MQuant® StripScan provides results in gradations of 0.5 pH units)

Conclusion

The MQuant® pH strip in combination with the MQuant® StripScan app is a quick and easy way to analyze the pH-values in soil samples. The measured values are comparable to those measured with the RQflex 20 and the pH electrode.

- MQuant® StripScan
- MQuant® Test Strips

Materials

Product #	Description
1.02382	Calcium chloride dihydrate for analysis EMSURE® ACS,Reag. Ph Eur for analysis EMSURE® ACS,Reag. Ph Eur
1.09535	pH-indicator strips pH 0 - 14 Universal indicator non-bleeding pH 0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 MQuant®
1.16996	pH Test Method: reflectometric with test strips pH 4.0 - 9.0 Reflectoquant®
1.03736	StripScan Reference Card for the measurement of MQuant® pH-indicator strips pH 0 – 14, Cat. No. 109535 MQuant®
1.16754	Water for analysis EMSURE® for analysis EMSURE®