

Application Notes Reflectometry – Ammonium in Soil Samples

Reflectometric determination by using the indophenol blue method

Reagents:

Cat.No. **116892** Reflectoquant® Ammonium Test
 Cat.No. **116899** Reflectoquant® Ammonium Test
 Cat.No. **117246** Reflectometer RQflex® 20
 Cat.No. **102382** Calcium chloride dihydrate



This application note pertains to RQflex®20 and all discontinued instruments (RQflex® 10, RQflex® plus)

Sample preparation:

Weigh approx. 150 g (exactly weighed) of homogenized soil into a beaker and add 600 ml of 0.0125 M CaCl₂ solution. Shake for 1 hour and filter through a filter paper immediately. Prepare the 0.0125 M CaCl₂ solution by adding 1.838 g Calcium chloride dihydrate to 1 l distilled water.

Analysis:

Rinse the test vessel several times with the sample solution and fill to the 5-ml mark. Add 10 drops of reagent NH₄-1 and swirl. Add 1 level blue microspoon of reagent NH₄-2 and swirl again. Press the reflectometer START button and simultaneously place the test strip in the sample (20 - 30 °C) for 8 min, ensuring that both reaction zones are immersed. Allow excess liquid to run off via the long edge of the strip on to an absorbent paper towel.

Measure the strip in the reflectometer. The value [mg/l] will be stored automatically. (Please refer to the RQflex® operating instructions and the package insert of the Reflectoquant® Ammonium Test.)

Calculation:



$$\text{Ammonium content [mg/l]} = \frac{\text{Measured value [mg/l]} \times \text{Vol. CaCl}_2 \text{ sol. [ml]}}{\text{Sample weight [g]}}$$

Results - comparison with photometric and official LUFA method:

Sample	Reflectoquant [kg NH ₄ -N/ha]	Photometry [kg NH ₄ -N/ha]	LUFA method [kg NH ₄ -N/ha]
1	14.19	16.29	15.72
2	12.51	13.02	12.81
3	9.72	8.01	8.37
4	28.20	26.70	27.21
5	25.71	27.45	24.63
6	4.86	5.82	5.40
7	4.05	5.49	5.37
8	2.34	1.47	1.65
9	1.56	1.86	2.07
10	26.97	29.40	26.61
11	26.13	26.04	23.46
12	12.18	12.60	11.73
13	11.37	10.89	10.50
14	1.56	1.95	2.04
15	12.60	11.58	10.86
16	10.92	11.91	11.31
17	58.05	58.89	55.74
18	50.25	56.49	53.58
19	8.07	10.32	9.54
20	1.56	1.98	1.17

Materials

Product #	Image	Description	Molecular Formula
1.16892		Ammonium Test Method: reflectometric with test strips and reagents 0.2 - 7.0 mg/l NH ₄ ⁺ Reflectoquant®	

Product #	Image	Description	Molecular Formula
1.16899		Ammonium Test Method: reflectometric with test strips and reagents 5.0 - 20.0 mg/l NH ₄ ⁺ Reflectoquant®	
1.02382	CaCl ₂ · 2H ₂ O	Calcium chloride dihydrate for analysis EMSURE® ACS, Reag. Ph Eur for analysis EMSURE® ACS, Reag. Ph Eur	CaCl ₂ · 2H ₂ O
1.17246		Reflectometer	