



DYNAMIC PREGL-DUMAS TECHNIQUE APPLIED IN NITROGEN DETERMINATION FROM INPUTS USED IN ORGANIC AGRICULTURE

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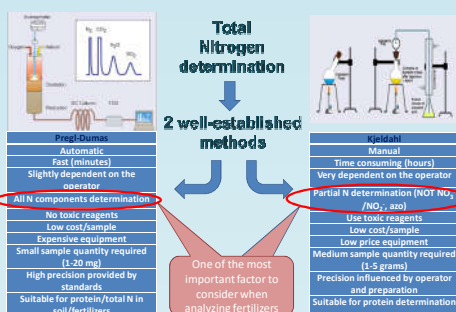
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INTRODUCTION

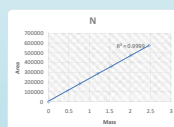


- There is no official method for analyzing nutrients in organic fertilizers
- Some standardized methods on dry combustion was developed for protein determination, total nitrogen in soils and classic fertilizers.
- Dumas method was successfully tested on fertilizers (Velp, 2018)
- All studies show that the method can be used successfully as an alternative to the Kjeldahl procedure
- More than 100 samples can be analyzed in one working day
- The equipment can be left to work all night long

Important facts about Dumas method

RESULTS AND DISCUSSIONS

Linearity	
Equation	a+b
Slope, a	231909
Correlation coef. R	0.9999
Regression coef. R ²	0.9999
y Intercept, b	3508

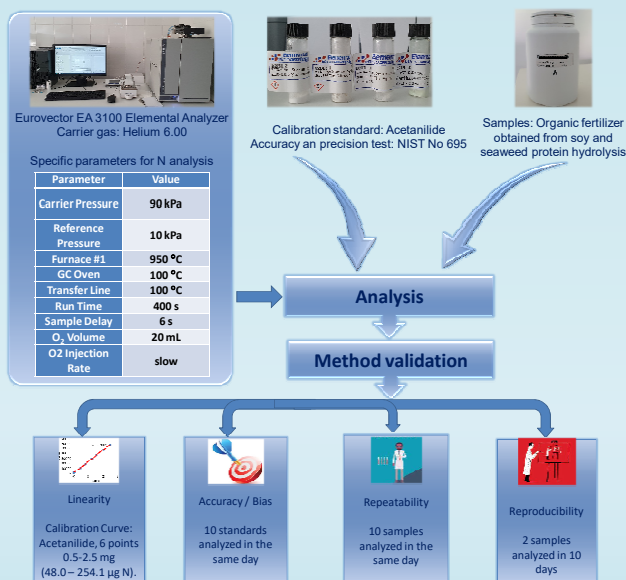


	Certificate value (%N)	Mean value	StDev	Accuracy	Bias	RSDr %	RSDR %
Acetanilide	10.34	10.391	0.085	100.49	0.49	0.823	1.316
NIST 695	13.9	13.139	0.029	94.53	-5.47	0.218	0.349
Organic fertilizer	-	4.004	0.075	-	-	1.883	3.013

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MATERIALS AND METHODS



CONCLUSIONS

- The method development highlighted good results:
 - linearity,
 - accuracy,
 - precision of repeatability,
 - precision of reproducibility
- The method was successfully applied for organic fertilizers
- The method can be optimized for other type of samples, as soils, plants, food, after a proper preparation of them

REFERENCES

- VELP Scientifica. (2018). Total Nitrogen Determination in Liquid Fertilizers. Dumas and Kjeldahl method comparison. Application note
- Müller, J. (2017). Dumas or Kjeldahl for reference analysis? Comparison and considerations for Nitrogen/Protein analysis of food and feed. Hilleroed, DK: FOSS.
- EURACHEM Guide - The Fitness for Purpose of Analytical Methods (2014).