

SOLUBLE NITROGEN – WISE BURROUGHS METHOD
Updated September 2013

I. Reference:

Burroughs, W., N.A. Frank, P. Gerlaugh and R.M. Bethke. 1950 J. Nutr. 40:9.

II. Personal Protective Equipment:

- A. Lab coat
- B. Safety glasses/goggles
- C. Latex gloves

III. Reagents:

A. Stock Mineral Buffer:

- 1. Sodium phosphate monobasic (H_2NaPO_4) 52.50
- 2. Sodium bicarbonate (CHNaO_3) 52.50
- 3. Ammonium sulfate ($\text{H}_8\text{N}_2\text{O}_4\text{S}$) 37.50
- 4. Potassium chloride (KCl) 7.50
- 5. Sodium chloride (NaCl) 7.50
- 6. Magnesium sulfate (MgSO_4) 2.25
- 7. Ferrous sulfate (FeSO_4) 0.15
- 8. Manganese sulfate (MnSO_4) 0.08
- 9. Zinc sulfate (ZnSO_4) 0.08
- 10. Copper sulfate (CuSO_4) 0.04
- 11. Cobalt chloride (CoCl_2) 0.02
- 12. Calcium chloride (CaCl_2) 0.75

a. Add to 1800 ml double distilled water (DDW).

b. Add CaCl_2 last when all other reagents are in solution.

c. q.s. to 2000 ml

B. Working Solvent

- 1. 100 ml Buffer from above and dilute to approximately 950 ml with DDW.
- 2. Adjust pH to 6.5 with ortho-Phosphoric Acid (H_3PO_4) and make up 1 liter.

III. Procedure:

- 1. Weigh between 2-5 g of sample into a 250 ml Erlenmeyer flask. Run in duplicate or triplicate and run blanks.
- 2. Add 100-200 ml of mineral solvent.
- 3. Place on shaker hot plate. Heat to 40°C and shake for 1 hour.
- 4. Filter into #541 filter paper and rinse several times with hot water. **Note: The buffer solution has ammonium sulfate. Thorough washing is essential for good nitrogen analysis in Step 5.**
- 5. Save filter paper and run Kjeldahls on them.
- 6. Calculate %N as with regular Kjeldahls. This gives % insoluble N.

IV. Calculations:

$$\frac{\% \text{ Total N in Sample} - \% \text{ Insoluble N}}{\% \text{ Total N in Sample}} = \% \text{ Soluble N as a \% of Total N}$$