

## 280 NH<sub>4</sub> AMMONIUM

0.1 - 2 ppm \ 120 Tests

*Berthelot's Indophenol Reaction*

- Fill 16mmØ tube with a fully extended (3.2ml) syringe of sample
- Add 6 drops of **NH<sub>4</sub>-1** and mix
- Add 2 drops of **NH<sub>4</sub>-2** and mix
- Add 2 drops of **NH<sub>4</sub>-3** and mix
- Set aside for 10' at 20-35°
- Switch on the Photometer 660
- Enter  and press  for 280 NH<sub>4</sub>
- Set filter as indicated to 690nm and press
- Insert tube with plain water and press
- Insert tube with prepared sample and press
- Record as Ammonium ppm (mg/l) 1 ppm NH<sub>4</sub> ≡ 0,78ppm NH<sub>4</sub>-N

The odourless ammonium cation is the first inorganic and therefore easily determinable compound formed during the on-going mineralization of proteins. An alkaline environment produces gaseous ammonia, discernible at poultry farms. The rapid and selective ammonium determination of *Nessler* (1856), often used as a stand-alone test for "potability", remained the best-known of all colorimetric tests for more than a century, because the only existing alternative reaction by *Berthelot* (1859) was far too slow. This changed somewhat after 1954 with the introduction of the catalyst sodium nitroprusside (reagent NH<sub>4</sub>-2) by *Lubochinsky & Zalta*. Ammonium becomes reactive on combining with hypochlorite (NH<sub>4</sub>-3) to form monochloramine. This attaches itself to a phenolic component, in this case Salicylate (reagent NH<sub>4</sub>-1), to give a reactive intermediate, which then couples with a further molecule of salicylate to a blue indophenol dye. The exact mechanism is unknown, although numerous detailed investigations on this topic have been published during the last 50 years, more than for any other colour reaction. The blue indophenol is masked by yellow cyanoferrates from the catalyst, giving a lemon yellow → bluegreen reaction contrast. Reaction conditions of 10' at 20-35° are a compromise, to be maintained for standardization. Residual hypochlorite in almost empty NH<sub>4</sub>-3 bottles is unstable and renewable by a product such as "Clorox". The WHO recommends < 1,5ppm NH<sub>4</sub> in drinking water. © *dr.bodart 0106*