

## 300 Ni NICKEL

0.1 -10 ppm \ 150 Tests

*Oxidation with Iodine → Dimethylglyoxime-Complex*

- Fill 16mmØ tube with a fully extended syringe (3.2mℓ) of sample
- Add 3 drops of **Ni-1** and mix
- Add 3 drops of **Ni-2** and mix
- Set aside for 1'
- Switch on the Photometer 660
- Enter  and press  for 300 Ni
- Set filter as indicated to 470nm and press
- Insert tube with plain water and press
- Insert tube with prepared sample and press
- Record as Nickel ppm (mg/ℓ)

Nickel is considered to be an essential trace element in certain organisms, though presently not within the human body. Its persistency in water is considered to exceed that of similar metals due to a greater stability of its chelates with natural chelate-formers such as humic acids. Apart from areas of mining, emissions result from metal-plating effluents with permissible levels usually around 2 to 3ppm. The carmine-red precipitate of the Ni(II)-complex with Dimethylglyoxime (DMG) described in 1905 by *Chugaev* (Reagent Ni-2) is probably the best-known example of a colour reaction between a metal and an organic reagent. *Feigl* 1924 und *Rollet* 1928 developed this into a colorimetric method on the basis of a red-brown soluble complex in an alkaline medium, after oxidation with iodine (reagent Ni-1). A tetragonal structure of the complex has been accepted for a long time. *Marov, Panfilov and Ivanova* (1976) consider the reaction product as a mixture of two from the four Ni(III)-complexes possible on the basis of this structure. In these, the -OH ligands are replacable by further DMG. Within the possibilities of substitution  $Ni(H-DMG)_2OH_2$ ,  $Ni(H-DMG)_2(DMG)OH$ ,  $Ni(H-DMG)_2(DMG)_2$  und  $Ni(DMG)_4$  two of these will always be in equilibrium depending on pH. As the permissible levels for nickel are orientated on the possibility of co-emissions rather than on criteria affecting public health, tolerance levels for water supplies are arbitrary. It should not be possible to detect nickel in these using this kit. The US-EPA requires less than 0.1ppm, British and German standards 0.05ppm at a WHO-guideline of 0.02ppm. © *dr.bodart 0106*