

221 Fe (H) IRON (H)

0.2 - 10 ppm \ 320 Tests

Formation of a Colour Complex with 2,2'-Bipyridine

- Fill 16mmØ tube with a fully extended syringe (3.2mℓ) of sample
- Add 3 drops of **Fe-H** and mix
- Set aside for 3'
- Switch on the Photometer 660
- Enter and press for 221 Fe (H)
- Set filter as indicated to 525nm and press
- Insert tube with plain water and press
- Insert tube with prepared sample press
- Record as Iron ppm (mg/ℓ)

A generally accepted content of 5% makes iron by far the most abundant heavy metal of the earths crust, and at the present state of knowledge also that of extra-terrestrial bodies with a surface composed of stone material. Dark colours of crystal-line rocks are mostly due to Fe(II), red and yellow tints of sediments to Fe(III). Denudation and decomposition of silicates causes oxidized iron to join aluminium in the clay fraction, optically most evident in red laterite soils of the humid tropics. Fe₂O₃ gives the colour to common building materials such as, bricks, roof tiles, Terracotta and red sandstone. Itself insoluble, hydrated ferric oxide can become adsorbed onto clay particles to be transported in suspension or a colloidal state in water. Fe(III) can redissolve by complexation with polyphenols of plant origin such as the tannins of humic acids or become reduced once more to Fe(II) in oxygen-deficient ground-water. When this reaches the surface it forms Fe(III)-oxyhydrate deposits typical of "yellow springs". Directly pumped ground water may become a problem at the point of use, when clear water containing Fe(II) develops the yellow-brown turbidity of Fe(III) on standing. Accounting for the fact that iron in surface-water is likely to be trivalent in colloidal or complexed form, the first step for determination is a mineralization and reduction to soluble divalent iron. For this, reagent Fe-H contains thioglycolate, known for its ability to solvate rust. The faintly violet Fe(II)-thioglycolate then reacts with 2,2'-Bipyridine, introduced by *Blau* in 1898 to give a carmine-red 1:3 complex. Resistant forms of Fe₂O₃ can at times require a longer dissolution-time than the prescribed 3'.

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