

251 HS HYDROGEN SULFIDE

0.05- 2 ppm \ 180 Tests

Synthesis of Thionine

- Fill 16mmØ tube with a fully extended syringe (3.2m^l) of sample
- Add 2 drops of **HS-1** and mix gently
- Add 2 drops of **HS-2V** and mix gently
- Add 2 drops of **HS-3** and mix
- Set aside for 2'
- Switch on the Photometer 660
- Enter and press for 251 HS
- Set filter as indicated to 578nm and press
- Insert tube with plain water and press
- Insert tube with prepared sample and press
- Record values as Sulfide ppm (mg/l) = S from HS⁻ and H₂S

The smell of rotten eggs in water is essentially due to hydrogen sulfide as H₂S gas, the form in which it occurs to around 50% in neutral and 10% in alkaline waters of pH 8. The rest is present as the non-discernible hydrogensulfide anion (HS)⁻. Sulfur constitutes ~0,04% of the earth's crust and is an essential constituent of living matter, with proteins containing 0.3-2%. On the earth's surface it is eventually oxidized to sulfate, being mostly bound as gypsum, CaSO₄. Hydrogen sulfide is consequently an indicator of decomposing organic material except in the rare cases of sulfate reduction or volcanic mineral water springs. It should therefore be undetectable in water intended for consumption. The treatment of para-Phenyldiamine (reagent HS-2) with H₂S followed by oxidation permitted *Lauth* to synthesize a violet dye in 1876. Although "*Lauth's Violet*" remained solely of scientific interest, this method of sulfur-dye synthesis began to gain commercial significance the following year for the manufacture of Tetramethyl-*Thionine* under the name of *Methylene Blue* by BASF. Amidosulfonic acid (reagent HS-1) converts the latter to H₂S while eliminating nitrite, liable to be found in HS-bearing waters. Each of the two H-atoms then become replaced by an aromatic ring from the diamine (HS-2). These are connected by an -S- bridge as well as one with -N= from an amino group. Oxidation with Fe(III) (reagent HS-3) finally gives this middle ring with its N- and S-bridges an aromatic character, leading to resonance over three rings, necessary for light absorption.

© dr.bodart 0106