

**380 503 SULFITE**

0.2 - 10 ppm \ 120 Tests

*Pararosaniline*

- Fill 16mmØ tube with a fully extended syringe (3.2mℓ) of sample
- Add 3 drops of **SO<sub>3</sub>-1** and mix
- Add 3 drops of **SO<sub>3</sub>-2** and mix
- Set aside for 5'
- Switch on the Photometer 660
- Enter **380** and press **E** for **380 503**
- Set filter as indicated to **578nm** and press **E**
- Insert tube with plain water and press **B**
- Insert tube with prepared sample and press **M**
- Record values as ppm (mg/ℓ) Sulfite SO<sub>3</sub><sup>2-</sup>

Sulfur dioxide emitted from the burning of fossil fuels becomes dissolved in the water vapour of the atmosphere to give sulfurous acid:  $\text{SO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_3$ . Oxidized to sulfuric acid  $\text{H}_2\text{SO}_4$ , this returns as acid rain to damage primarily coniferous trees, while being able to reduce the pH of unbuffered low-hardness water bodies to values below 3. A major use of sulfite is for leaching lignin out of wood pulp in paper manufacture. Low cost and ease of oxidation makes sodium sulfite the classical oxygen scavenger for water of steam boilers and -turbines. Of lower toxicity than hydrazine, it requires around ten times the quantity, leaves sulfate residues and the possibility forming  $\text{H}_2\text{S}$  at high pressures. A direct intake of sulfite arises from its use as a stabilizer for foods and wine. Sulfite in concentrations from 30 to 400ppm prevents the air oxidation of ethanol  $\rightarrow$  acetaldehyde  $\rightarrow$  acetic acid. In this way, aromas are maintained, white wines are prevented from darkening, red wines from bleaching. Numerous foods, especially frozen vegetables are preserved with sulfite for the sake of retaining attractive colours. Certain individuals show an allergic reaction to this, leading to headaches or *Sulfite-Asthma*. Sulfite reacts with formaldehyde (reagent SO<sub>3</sub>-2) to give hydroxymethyl sulfonic acid:  $\text{H}_2\text{SO}_3 + \text{HCHO} \rightarrow \text{HO-CH}_2\text{-SO}_3\text{H}$ . With decolorized acid Pararosanilin (reagent SO<sub>3</sub>-1) this forms a blue-violet adduct. Mechanism and products of this reaction adapted by *Steigmann* (1942) and *West & Gaeke* (1956) for determining sulfite are speculative. At the beginning all prepared samples have a uniform magenta colour. During the 5' reaction time, blanks will bleach to colourless, whereas samples with sulfite become blue-violet. Juices and wine are diluted 5 to 100-times for analysis. A blank tube is prepared the same way with sample + dilution water, without adding reagent.

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