

371 Si (H) SILICON (H)

3 - 60 ppm \ 180 Tests

Silicomolybdic Acid

- Fill 16mmØ tube with a fully extended syringe (3.2m^l) of sample
- Add 4 drops of **Si-1** and mix - set aside for 2'
- Add 2 drops of **Si-2** and mix - set aside for 2'
- Switch on the Photometer 660
- Enter and press for 371 Si (H)
- Set filter as indicated to 436nm and press
- Insert tube with plain water and press
- Insert tube with prepared sample and press
- Werte als Silicon ppm (mg/l) 1ppm Si ≡ 2.14ppm SiO₂

The rocks making up the earth's crust contain an average of 28% silicon. 17% form aluminosilicates (Feldspars, Clays), 6% silicon dioxide (Quarz) and the rest dark ferromagnesian silicates (Olivines, Pyroxenes, Amphiboles). Natural waters contain silicon as suspended matter (sand), colloids (kieselgels) and in solution (salts of silicic acid). The latter are formed by the reaction $\text{SiO}_2 + 6\text{H}_2\text{O} \rightarrow \text{H}_4\text{SiO}_4 \cdot 4\text{H}_2\text{O}$. In view of a solubility of ~50ppm Si at pH7 and 25° the content in water depends largely on the conditions prevailing at the point of origin. Silicon is bound to oxygen both in water as in rocks, resulting in it normally being referred to as silica, SiO₂. Concordant with former practice, this describes its deposition product, rather than the soluble silicate form it is mostly encountered in water. Molybdate in dilute sulfuric acid (reagent Si-1) reacts with soluble silicates and those forms of colloidal SiO₂ that can be mineralized under these conditions:- $\text{H}_4\text{SiO}_4 \cdot 4\text{H}_2\text{O} + 12\text{H}_2\text{MoO}_4 \rightarrow \text{H}_4[\text{Si}(\text{Mo}_3\text{O}_{10})_4] + 16\text{H}_2\text{O}$. Besides the yellow β-silico-molybdic acid the weakly coloured heteropoly acid of phosphorous is formed. This is selectively destroyed by the addition of tartaric acid (Si-2). Water with extreme silicon levels above 200ppm is known from warm alkaline springs, such as at Yellowstone National Park. Hot and dry areas as in parts of Mexico have ground waters in the region of 25 to 50ppm. When siliceous waters reach the surface a large part of the silicon becomes deposited as amorphous SiO₂. While silicon in water is of prime importance where steam is generated and used, it has no toxicological importance, which has resulted in an absence of recommendations in water for human consumption. © dr.bodart 0106