

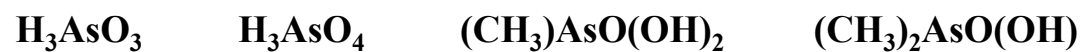
Research Method Development

● Speciation of arsenic compounds in natural water

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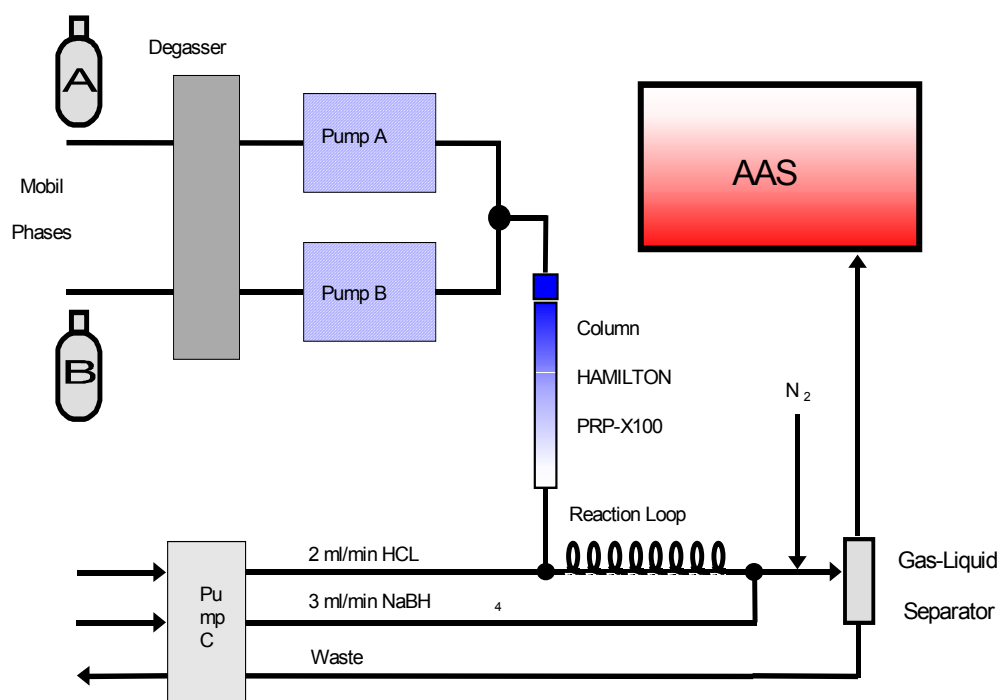
In natural water (groundwater, drinking water and soil pore water) different arsenic compounds like arsenite, arsenate, mono- and dimethylarsinic acids are found depending on conditions like bacterial activity, Eh, and pH. These compounds are characterised by different toxicology, solubility and the adsorption on solid phases.

The following arsenic compounds are found in natural water:



To determine the different species in water samples **anion- exchange HPLC** was combined with **hydride- generation atomic absorption spectrometry** for the routine speciation of the compounds listed above .

The sensitivity of the used detection system was increased by a post- column reaction system, to achieve a complete formation of volatile arsines from all separated species. Detection limits of all arsenic compounds range between 0.5 and 1.0 µg/l without pre-concentration.



| HPLC- parameter: | | AAS- parameter: | |
|--------------------|--|---|----------|
| Modus: | gradient- elution | Cell_{Temperatur}: | 900 °C |
| Eluents: | phosphate- buffer A: 0,0025 mol/l (pH= 6,0) B: 0,1 mol/l (pH= 6,5) | HCLamp: | As - PE |
| Separation: | 0- 4 min: 0% B / 100% A 4- 8 min: 100% B / 0% A | λ_{As}: | 193,7 nm |
| Flowrate: | 2ml/min | slit: | 0,7 nm |
| | | Integration: | 15 sec. |
| | | Sample in 3% HCL | |
| | | Reduction reagent 0,2 % NaBH ₄ in 0,05% NaOH | |

