# Iron in boiler feed water

## Straightforward, sensitive, and cost-efficient determination using adsorptive stripping voltammetry (DHN method)

The iron concentration in boiler feed water must be monitored to ensure reliable and safe operation of the water-steam circuit in thermal power plants. Iron ions, even in low concentrations, are an indicator for corrosion and therefore can signal potential safety issues. Various guidelines set limits for the maximum iron content in boiler feed water.

The concentration of total iron in boiler feed water can be determined with high sensitivity using adsorptive stripping voltammetry (AdSV) using 2,3-dihydroxynaphthalene (DHN) as complexing agent. Concentrations of total iron in water samples can be determined down to approximately 0.1 µg/L with this method.

The AdSV method is simple to perform, specific, and free of interferences. It is a viable, less sophisticated alternative to atomic absorption spectroscopy (AAS) or inductively coupled plasma (ICP) requiring only a moderate investment in hardware and low running costs.

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## SAMPLE

Boiler feed water

## EXPERIMENTAL

The water sample, DHN solution, and the buffer solution are pipetted into the measuring vessel. The determination of total iron is carried out with an 884 Professional VA using the parameters specified in **Table 1**. The concentration is determined by two additions of an iron standard addition solution.
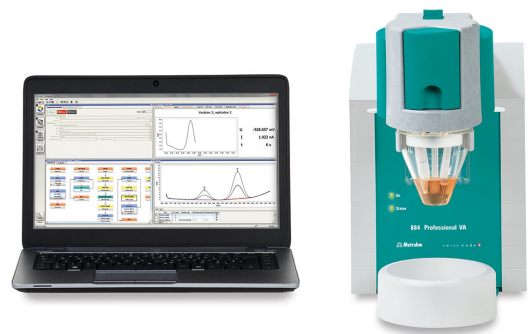


**Figure 1.** 884 Professional VA.

**Table 1.** Parameters for adsorptive stripping voltammetric (AdSV) analysis of Fe in boiler feed water

| Parameter | Setting |
|---|---|
| Working electrode | HMDE |
| Mode | DP – Differential Pulse |
| Deposition potential | -0.1 V |
| Deposition time | 30 s |
| Start potential | -0.2 V |
| End potential | -1.2 V |
| Peak potential Fe | -0.7 V |

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## ELECTRODES

- Working electrode: Multi-Mode Electrode pro with standard glass capillaries

- Reference electrode: Ag/AgCl/KCl (3 mol/L) reference electrode with electrolyte vessel. Bridge electrolyte: KCl (3 mol/L)
- Auxiliary electrode: Platinum rod electrode

## RESULTS

The determination of total iron in boiler feed water samples can be carried out in a simple and straightforward manner with adsorptive stripping voltammetry (AdSV).
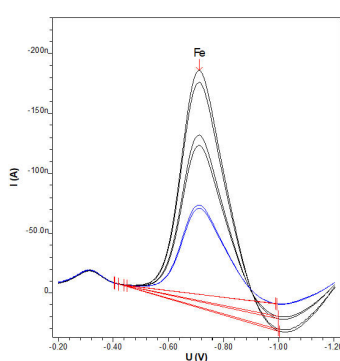


**Figure 2.** Determination of total Fe in boiler feed water.

**Table 2.** Results of total Fe determination with the 884 Professional VA

| Sample | Total Fe [μg/L] |
|---|---|
| Boiler feed water | 3.0 |

Internal reference: AW VA CH4-0513-072012

## CONTACT

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# CONFIGURATION



**2 Dosino（MME）884 Professional VA semiautomated**

用于多模式（MME）的 884 Professional VA semiautomated 是一台操作方便的常分析,可采用多模式 pro 或 scTRACE Gold 行伏安量和法痕量定。此已的瑞士万通技与恒位/恒位以及外接的活 viva 件用,在重金属定域中展了新的前景。有的校准器的恒位在每次量之前均自冲洗行校准,保精度。

通此器也可使用旋行定,例如借助«循伏安溶出法»(CVS)、«循脉冲伏安溶出法»(CPVS)和位法(CP)定池中的有机添加。借助可更的量,可在使用不同的各用之快速切。

台随附的 800 Dosino 可在定程中自添加助溶液,例如解、冲液或准溶液。

使用 viva 件行控制、数据采集和估。

用于多模式（MME）的 884 Professional VA semiautomated 供有大量附件,以及用于多模式 pro的量。和 viva 可独。

## VA pro Professional VA

整套,用于和伏安定。包含多模式 pro、参比、助、量杯、拌器、解溶液和其它用于建工作台以及行多模式的附件。

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