

VA Application Note No. V - 125

Title:	Determination of traces of iron in water (1-nitroso-2-naphthol method)
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Summary:	<p>The concentration of Fe is determined in water samples by adsorptive stripping voltammetry with 1-nitroso-2-naphthol as complexing agent. All reagents have to be added in the order as listed below.</p> <p>All reagents typically contain iron impurities. Therefore a subtraction of the reagent blank is recommended.</p> <p>Fe(II) and Fe(III) show different sensitivities. Therefore the sample should only contain one of the iron species.</p> <p>Ascorbic acid (Vitamin C) can be added to the measuring solution and to the Fe(III) standard solution if both Fe(II) and Fe(III) are present in the sample to determine the concentration of total iron. A final concentration of ascorbic acid of 0.002 mol/L is suitable.</p>
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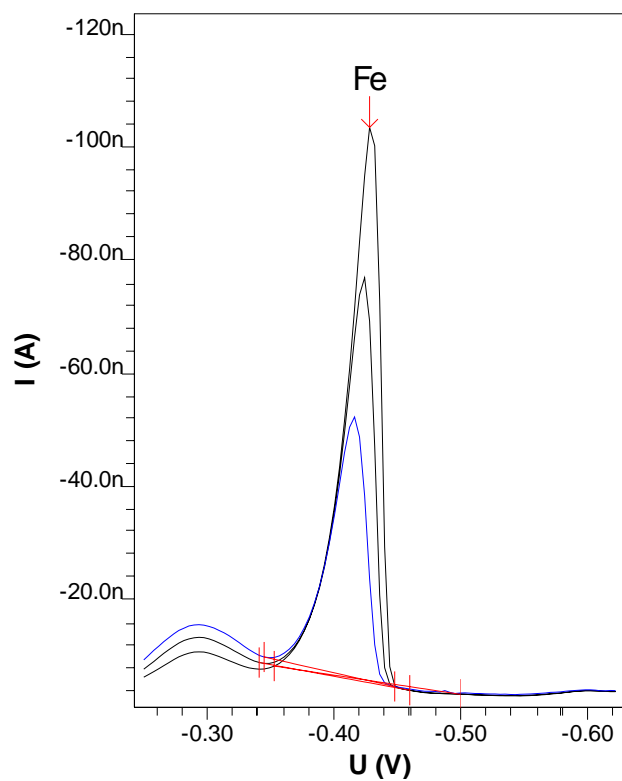
Sample:	Ultrapure water
Sample preparation:	none

Analysis of Fe(III)		
PIPES buffer pH 8.0	c(PIPES) = 1 mol/L c(NaOH) = 0.5 mol/L → adjust pH to 8.0 ± 0.1 with NH_3 solution <i>PIPES = Piperazine-1,4-bis(2-ethansulfonic acid)</i>	
NN solution	c(NN) = 0.002 mol/L in 0.25 mol/L NaOH or c(NN) = 0.002 mol/L in ethanol <i>NN = 1-Nitroso-2-naphthol</i>	
Measuring solution	10 mL (diluted) sample + 200 μL PIPES buffer + 200 μL NN solution → adjust pH to 6.9 ± 0.1 with NH_3 or HNO_3	
Working electrode (WE)	MME (Multi Mode Electrode) 6.1246.020	
Auxiliary electrode (AE)	Pt 6.0343.000	
Reference electrode (RE)	Ag/AgCl/KCl (3 mol/L): 6.0728.020 + 6.1245.010	
Parameters	Working electrode	HMDE
	Stirrer speed	2000 rpm

	Mode	DP
	Purge time	300 s
	Deposition potential	-0.15
	Deposition time	45 s
	Equilibration time	5 s
	Pulse amplitude	50 mV
	Start potential	-0.2 V
	End potential	-0.6 V
	Voltage step	4 mV
	Voltage step time	0.5 s
	Sweep rate	8 mV/s
	Peak potential Fe	-420 mV

Results:	Fe
	4.5 µg/L

Determination of Fe



Fe
 $c = 4.464 \text{ µg/l}$
 $\pm 0.036 \text{ µg/l (0.80\%)}$

