VA Application Note No. V-82

Title:	Different chromium species in sea water

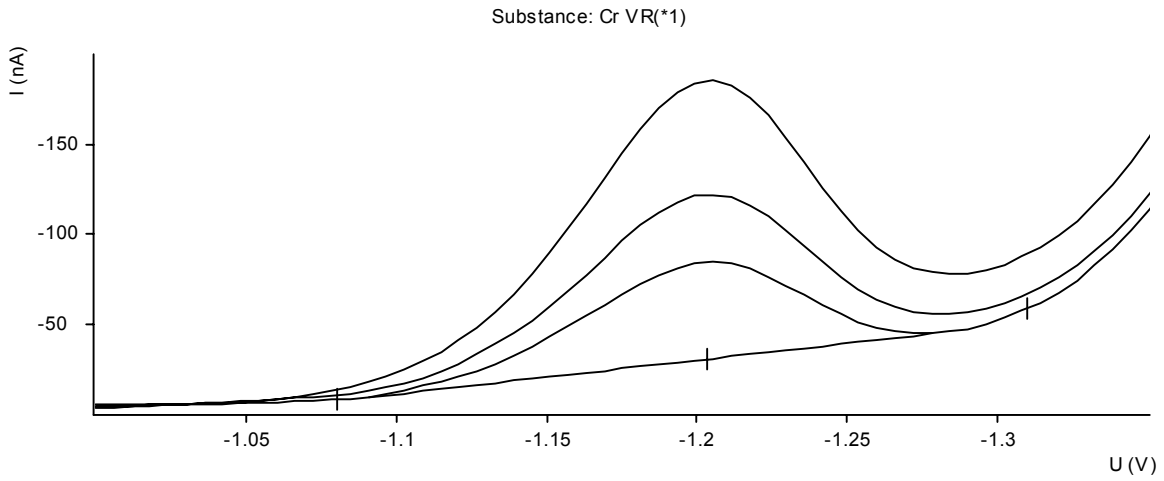
Summary:	Cr(III) forms an electrochemically active complex with diethylenetriaminepentaacetic acid (DTPA), so does Cr(VI) after in situ reduction on the surface of the HMDE. Depending on the sample preparation procedure and the waiting time after the addition of the complexing agent, the different chromium species can be differentiated: ● **Total active chromium** [total concentration of Cr(VI) and free Cr(III)]: The measurement is carried out immediately after the addition of DTPA. ● **Cr(VI):** Between the addition of DTPA and the start of the analysis a minimum waiting time of 30 min is necessary. During this waiting time the Cr(III)-DTPA complex becomes electrochemically inactive. ● **Cr(III):** The difference between the total active Cr and Cr(VI). ● **Total chromium:** Determination of total active Cr after UV digestion.

Sample:	Sea water
Sample preparation:	UV digestion for the determination of total chromium

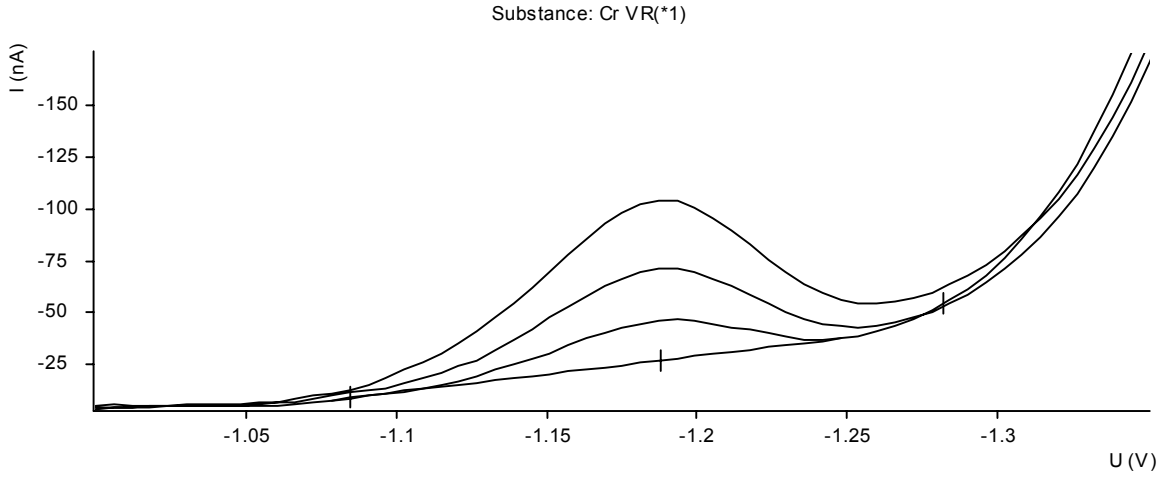
All Cr species:		
Electrolyte:	Acetate buffer + DTPA + sodium nitrate (pH = 6.2)	
AE:	Pt	
RE:	Ag/AgCl/KCl (3mol/L)	
Parameters:	DPAdSV at HMDE	
	Deposition:	–1000 mV (20 s)
	Determination:	–1000 mV to –1400 V
	Peak potential Cr:	–1200 mV

Results:	Cr(total)	Cr(total active)	Cr(VI)	Cr(III)
	1.74 µg/L	0.68 µg/L	0.47 µg/L	0.21 µg/L

Determination of total chromium



Determination of total active chromium



Determination of Cr(VI)