# 4.3 Optimizing the ion source parameters **OmniStar**☆

The ion source parameters must be optimized in regular intervals, in particular during the first time operation and after all service work on the ion source.

The optimization procedure differs, depending on the existing configuration, measurement task, and available test gas.

- Optimizing with test gas air  $\rightarrow$  section 4.3.3 •
- Optimizing with test gas argon  $\rightarrow$  section 4.3.4

### 4.3.1 Preparatory steps

LP . Read this section only when you are prompted to do so.

- Start the <TuneUp> program
- Open the inlet valve:
  - In the menu bar chose <Manual>
  - Choose <DI/DO...>
  - To activate double click Valve
  - Close window with <OK>
- In the menu bar choose <Tune> •
- Choose < Ion Source>

### 4.3.2 Finishing steps

Read this section only when you are prompted to do so.

- Optimize the display as follows:
  - Test at which RF Polarity the better peak shapes are obtained and choose the corresponding polarity.
  - Set Field-Axis in such a way that a useful resolution and peak shape are obtained.
  - Alternatingly optimize Extraction and Focus to maximum peak height
- Close <Tune Ion Source QMA 200> •
- Save the changes by confirming the prompt with <YES>
- Close <TuneUp> •

#### 4.3.3 OmniStar☆ with test gas air

Optimization with the test gas air is to be performed if no special test gas is available.



Preparation  $\rightarrow$  section 4.3.1



Adjust all parameters as shown in the picture below:

Tune Ion Sectic GMA 200							
Cile Display	Option	-					
Thresh. OFF	· 200804	E IS Type	: HS TUNGSTEN				
Channel	0 ENABLE			RF-Polarity	inverse		
Detector		Amplifier		IS-Volkages [M			
Type	PARADAY	Range	-	IanFict	150		
SEM Volt.	-	Offset	ON	Cathade	78.0		
				Focus	5.00		
Mess		Tion Source		Field Axis	6.00		
Mode	SCAN-F	Filement#	PH 1	Extract	199		
First	25.00	15-Set #	SET 1				
10100	10						
Speed	16	□IS-Emission*		FR. Post. Three	sh. [mber]		
Resolution	50	Emiss [mA]	1.88	ON below	-		
Threshold	-	Protect (A)	3.58	OFF above	2.002-04		

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Choose <Display> for displaying the peak groups of nitrogen and oxygen.

Quit the optimization  $\rightarrow$  section 4.3.2

## 4.3.4 OmniStar☆ with test gas argon

Optimization with the test gas argon is to be performed if argon is subsequently to be analyzed. A setting of "Cathode" to 40 V prevents formation of  $Ar^{++}$  ions and allows detection of low  $H_2O$  concentrations on mass 18 amu.



Make sure that argon is connected to the GSD 300 and that the feeder lines are thoroughly purged.

Preparatory steps  $\rightarrow$  section 4.3.1

2 Adjust all parameters as shown in the picture below:

Tune Ion Seattle GMA 200						
Eile Display Thresh OFF	Dation	S Type: HS TUNGSTEN				
Channel r Detector	0 ENABLE	(Amelifier	RF-Polarity inverse CIS-Veltages M			
Type SEM Velt.	PARADAY 	Range Offset ON	lanRef 105 Cathode 48.0 Focus 5.00			
Mess Mode	SCAN F	for Source Plancet # Pit 1	Field Axis 6.00 Extract 100			
First Width	7	E-Sat # SET 1				
Speed Resolution	1s 50	Emission Emiss (nA) 1.00	Fil. Prot. Thresh. [mbor] ON helow -			
Threshold	-	Protect (A) 3.58	OFF above 2.00E-04			



Choose <Display> for displaying the peak groups of argon.

Quit the optimization  $\rightarrow$  section 4.3.2