ICP-OES 操作规程

一、开机流程：

1. 开外设。包括：Ar 气体（分压表头读数：0.5-0.8MPa）；水循环（18℃）；空气压缩机（不低于 60P.可达 85PSI）
2. 开主机：打开机身开关，开排风，开启桌面上的软件图标，进入 WinLab32 操作平台。

此时仪器处于 standby 状态，保持此状态约 3-4 小时，由仪器自动控制 warm-up 时间，软件显示仪器状态。

二、运行机器流程：

①检查Ar气体压力、②检查排风、③开蠕动泵、④等离子控制：冲洗flush（观察管路通畅情况）、⑤等离子控制：点火（点燃等离子体，待等离子炬焰稳定后(通常需要20min～30min)，将系列标准溶液引入炬焰，对仪器进行标准化，达到仪器示值与标准溶液的标示值相符）、
⑥手工分析控制：式样分析（高浓度样品校正）——检查——数据——选择数据组、⑦手工分析控制：分析空白、⑧手工分析控制：分析标样、⑨手工分析控制：式样。做样同时开启 光谱 结果 同时观测结果和光谱图。

进行分析前先建立方法：文件—新建—方法

- 选择测量等离子状态（含水、有机、添加条件）再确定，进入方法编辑器：在光谱仪—定义元素表格中输入方法描述，并通过元素周期表选择元素和波长；最后保存编辑的方法！：文件—保存—方法：给方法取名字！点击 手工：进入手工分析控制。
- 进行分析前先打开“结果数据组名称”给分析结果取名称！（结果数据组名称一般为：新编辑的方法名称—日期—序号）；并在分析过程中保存数据。

- 之后进行：高浓度样品谱线校正—分析空白—分析标样—式样。同时开启 光谱 结果 同时观测结果和光谱图。结果数据处理：直接查看或者打印结果

三、关机流程：

- 熄火（等离子）：点击操作面板右上方 等离子体 符号出现下图关闭等离子体：

先冲洗（flush）再关等离子体

- 关闭等离子体后待“等离子控制”面板上的“*等离子体，辅助，雾化器，应用，泵，冲洗*”均为**灰色**时才可以退出软件  。

1) 松蠕动泵。
2) 处理数据。
3) 关主机。
4) 关外设（Ar 气体；水循环；空气压缩机、空压机放水  ）。

注意：此时机器完全关闭。重新开机按照开机流程开机。也可退出软件；关 Ar 气体；水循环。这样没有完全关机，这中状态下开机流程为：关主机；等 5 分钟后，开 Ar 气体；水循环；开主机。

基础化学实验教学示范中心

2006 年 9 月

ICP-OES SOP

1. **Start-up process:**

   1) Turn on the peripherals. Including: Ar gas (partial pressure gauge head reading: 0.5-0.8MPa); water circulation (18°C); air compressor (not less than 60P. Up to 85PSI)

   2) Turn on the main unit: turn on the switch of the main unit, turn on the exhaust fan, turn on the software icon on the desktop, and enter the WinLab32 operating platform.

   - At this time, the instrument is in the standby state, and this state is maintained for about 3-4 hours. The warm-up time is automatically controlled by the instrument, and the software displays the instrument status.

2. **Operational process:**

   ① Check the Ar gas pressure, ②Check the exhaust fan, ③Turn on the peristaltic pump, ④Plasma control: flush (observe the smoothness of the pipeline), ⑤ Plasma control: ignite (ignite the plasma, wait for the plasma torch to stabilize (usually 20min) ~30min), introduce a series of standard solutions into the torch flame, standardize the instrument, so that the displayed value of the instrument is consistent with the marked value of the standard solution),⑥ Manual analysis control: Pattern analysis (correction of high concentration samples) - Check - Data - select data group, ⑦ Manual analysis control: Analyze blank, ⑧ Manual analysis control: Analyze standard sample, ⑨ Manual analysis control: Pattern. Enable  and simultaneously observe the spectra and result when running instrument.

   Create a method before conducting an analysis: File - New - Method

   - Select the measurement plasma state (water-containing, organic, adding conditions) and then confirm, enter the method editor: enter the method description in the Spectrometer - Define Elements table, and select the element and wavelength through the periodic table of elements; finally save the edited method! : file - save – method→give the method a name! Click  : enter manual analysis control.
   - Before performing analysis, open "Result Data Group Name" to name the analysis results! (The name of the result data group is generally: the name of

the newly edited method - date - serial number); and save the data during the analysis. 

- Afterwards: high-concentration sample spectral line calibration—analytical blank—analytical standard—sample. Enable  to observe the spectra and result at the same time. **Result data processing**: view or print the results directly.

3. Shutdown process:

- Turn off the flame (plasma): click the symbol  on the upper right of the operation panel, the following figure appears. Turn off the plasma: flush first and then turn off the plasma
- After the plasma is turned off, the software can be exited only when "*Plasma, Auxiliary, Atomizer, Application, Pump, Rinse*" on the "Plasma Control" panel are all **gray.**

1) Loosen the peristaltic pump.
2) Processing the data.
3) Shut down the host.
4) Turn off peripherals (Ar gas; water circulation; air compressor, air compressor water release).

NOTE: The machine is completely shut down at this point. Reboot should follow the Start-up process. After exiting the software, turn off Ar gas; water circulation. In this way, it is not completely shut down. The startup process in this state is: shut down the main unit; after 5 minutes, turn on the Ar gas; water circulation; turn on the host machnie.

典型的 ICP-OES 分析方法

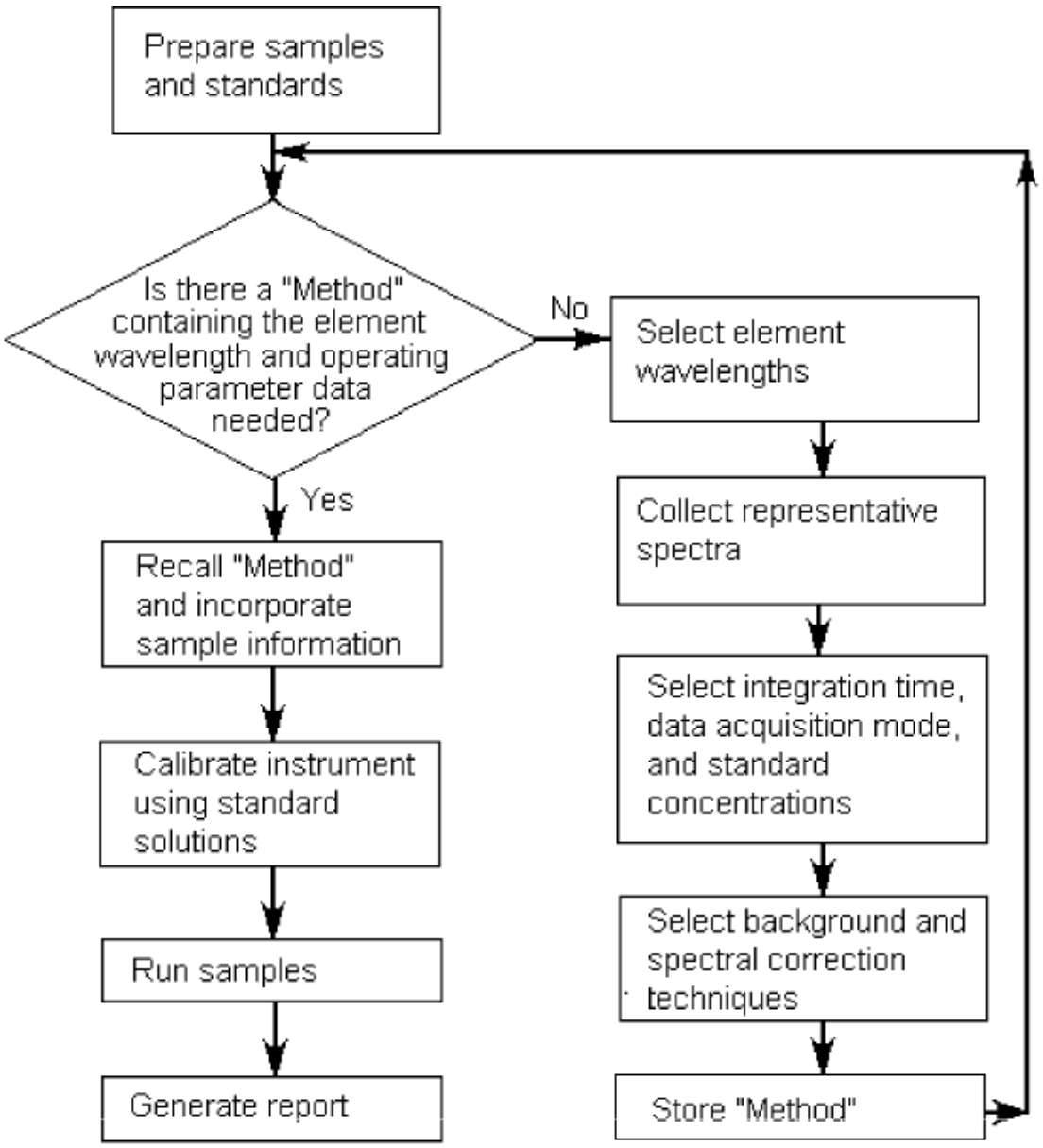

Figure 1.Flow chart showing the methodology for a typical ICP-OES analysis.

典型的 ICP-OES 仪器布置图

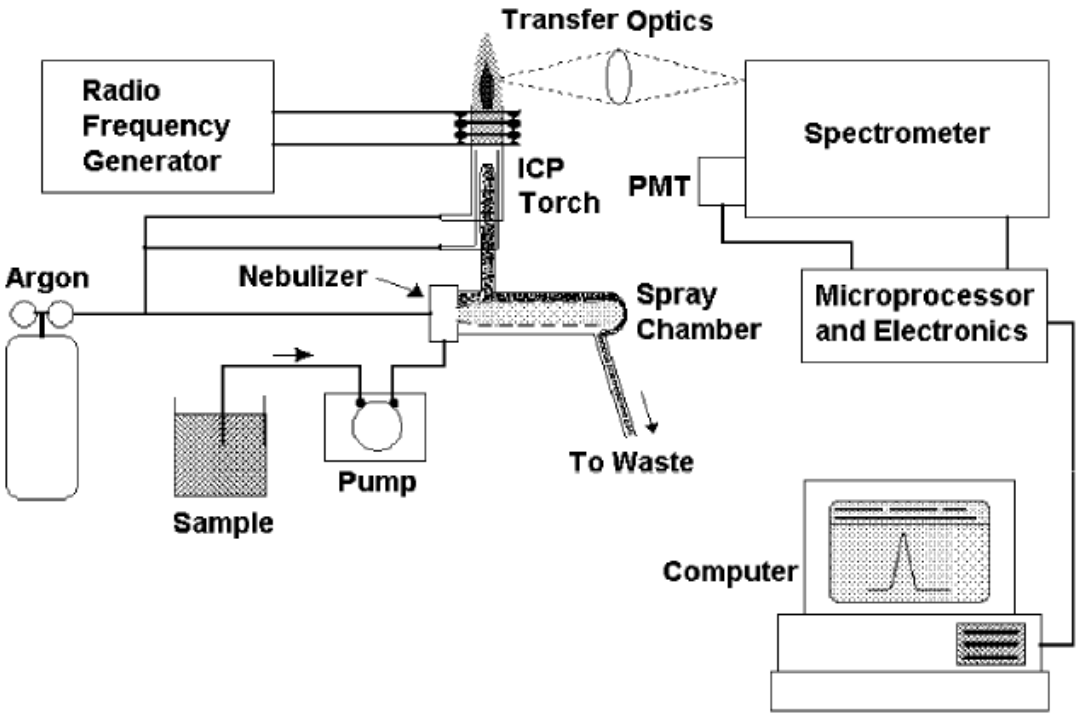

Figure 2.**Major components and layout of a typical ICP-OES instrument.**