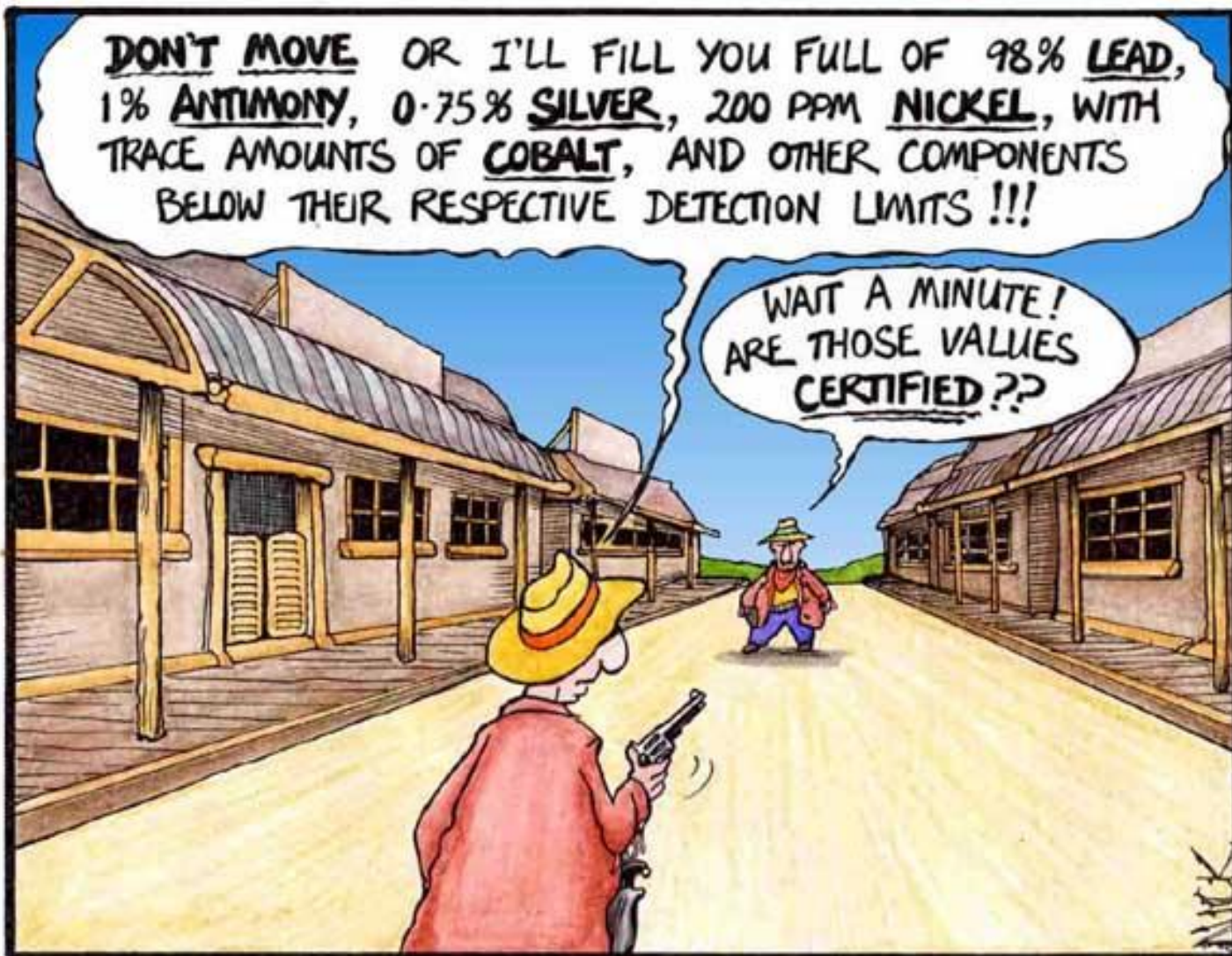




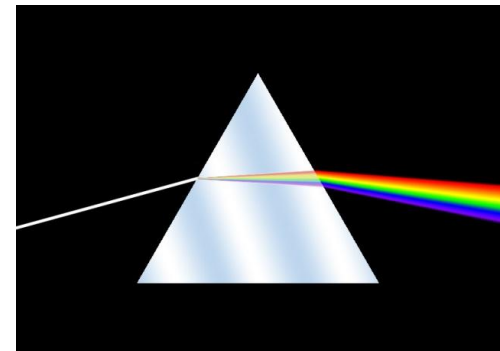
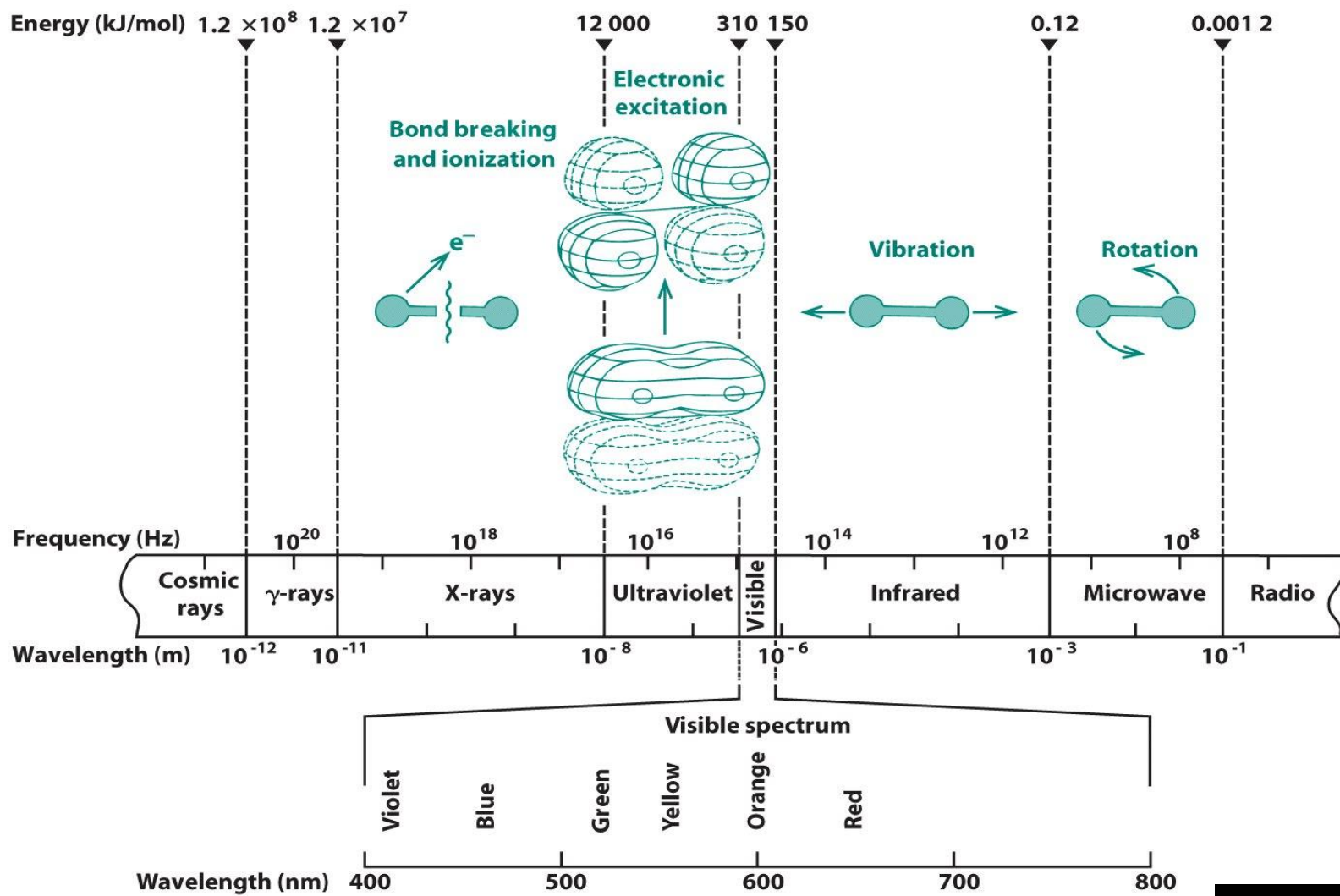
ANALYTICAL CHEMISTS IN THE WILD WEST

# Hg Analysis: Instrumentation

- Atomic Absorption Spectrometry (AAS)
- *Atomic Fluorescence Spectrometry (AFS)*
- Total Mercury Analyzer (gold trap-pyrolysis-AAS)
- Inductively Coupled Plasma – Mass Spectrometry (ICP-MS)

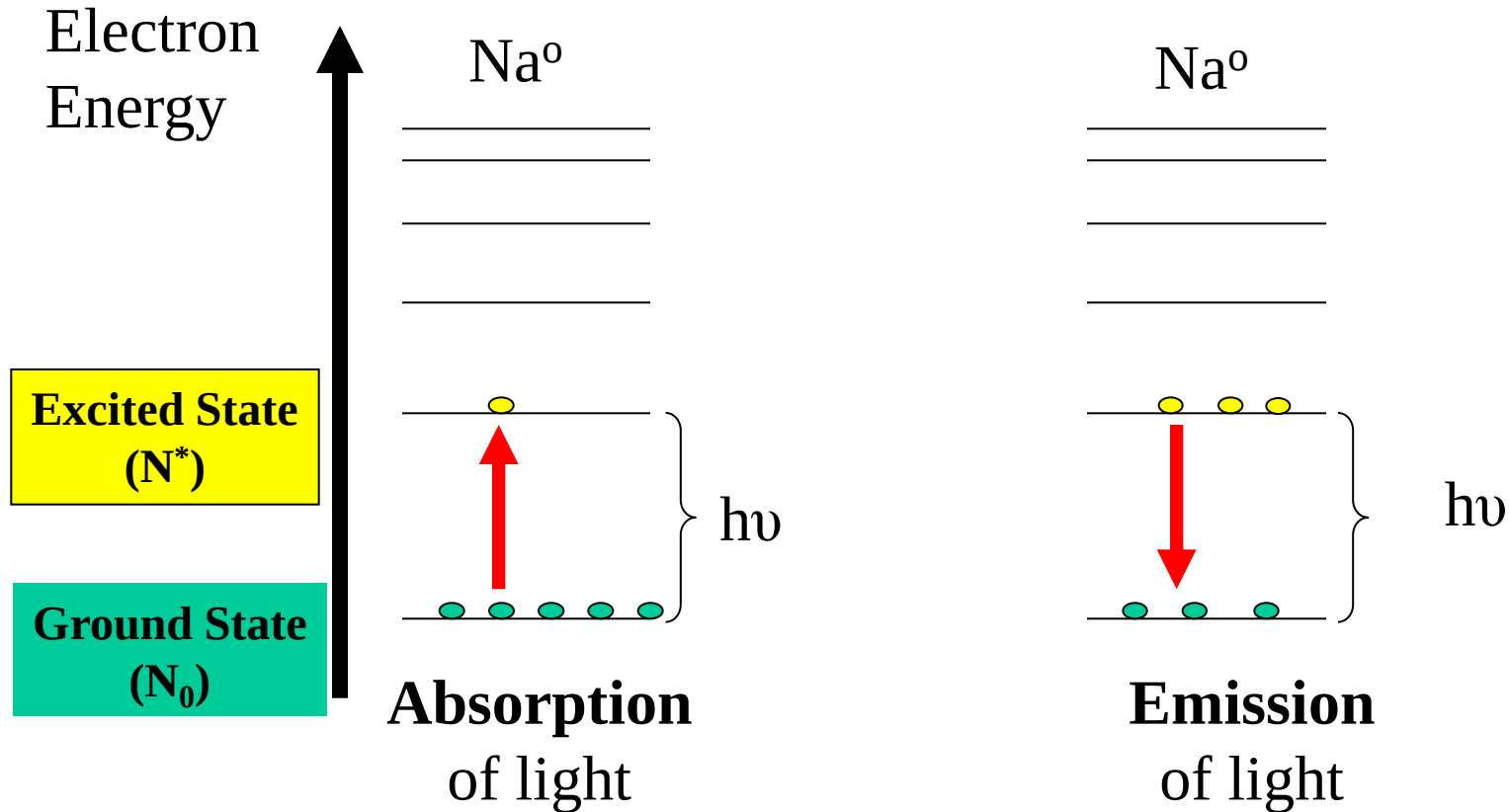
Requirements for **AFS** and **AAS**: Hg must be in the elemental form ( $\text{Hg}^0$ );

- (Chemical) Reduction of  $\text{Hg}^{2+}$  prior analysis;
- (Pyrolytic) Reduction and breaking Hg-C bond of MeHg prior analysis



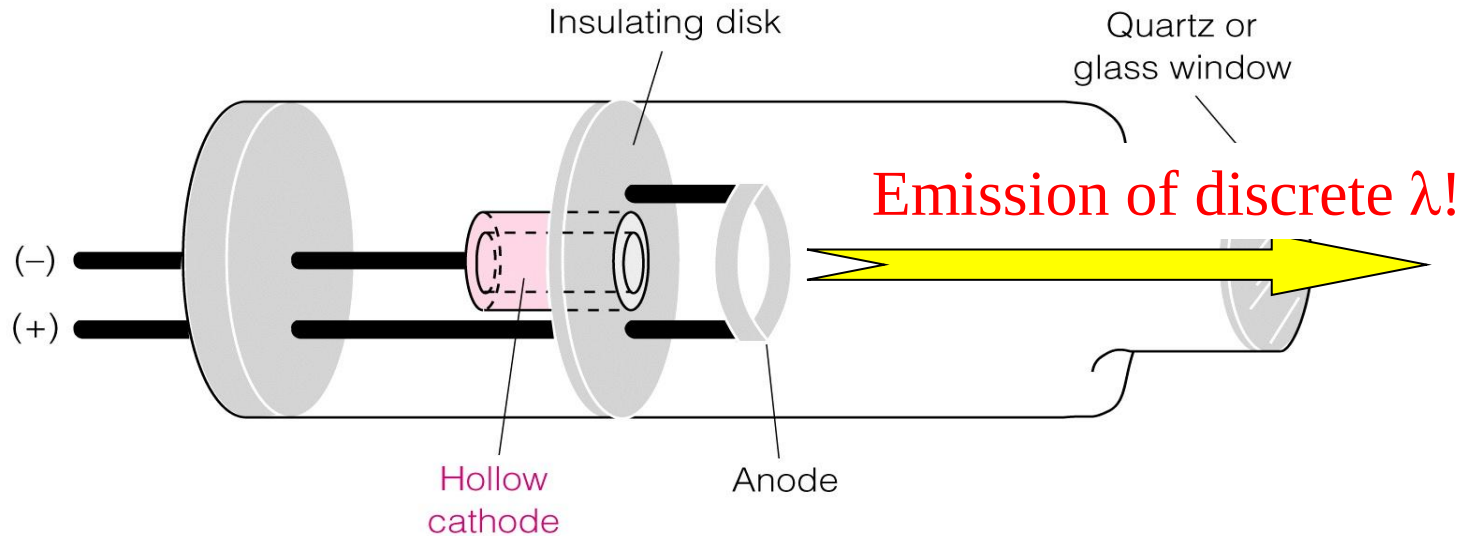
# Atomic Spectrometry

- In atomic spectrometry, we use the excitation state of electrons in an **ATOM**



- In atomic fluorescence spectrometry, we excite the electron by applying the appropriate wavelength, then **measure** the light subsequently emitted (Atomic Emission) by the Hg Atom

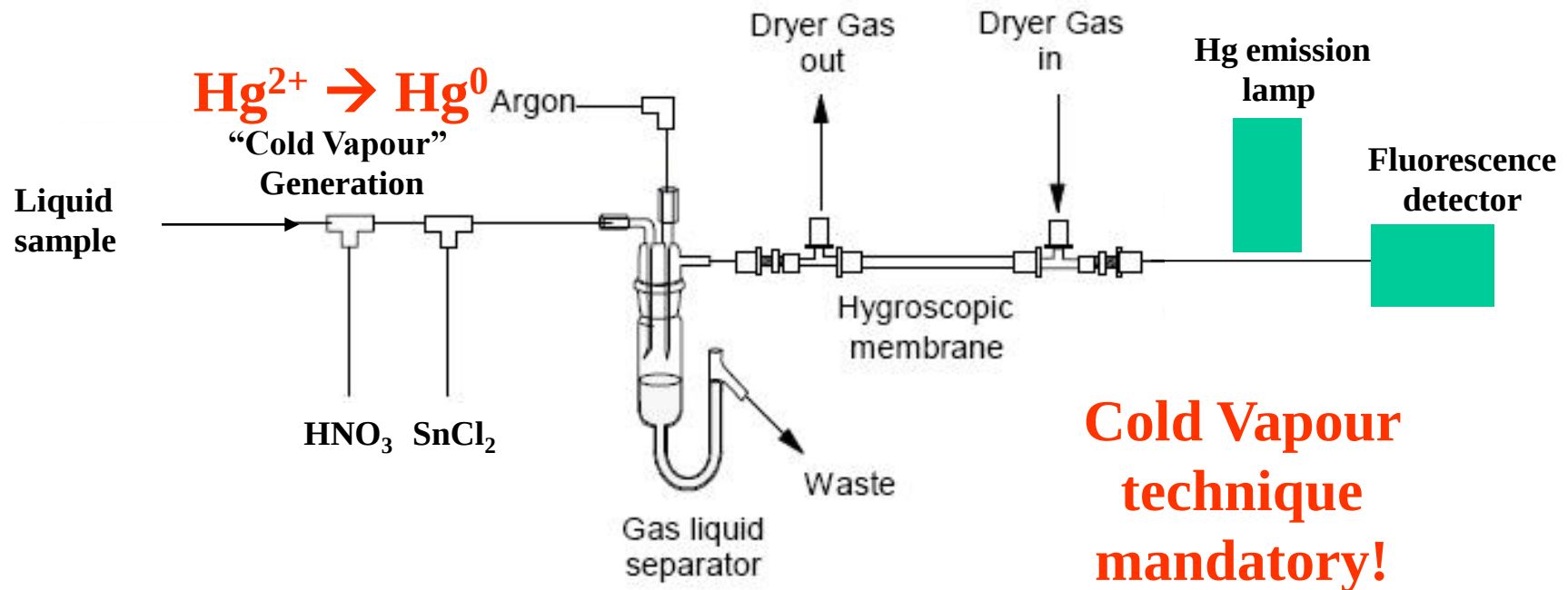
# Light Source: Hollow Cathode Lamp



- Hollow cathode made of element of interest (e.g. of Na to measure Na! Selectivity of AAS!)
- Potential of 100-400 V ionizes Ne (glow discharge)
- $\text{Ne}^+$  hit the cathode and excite the element
- Emission lines are generated.
- Low pressure and filled with Neon (Ne)

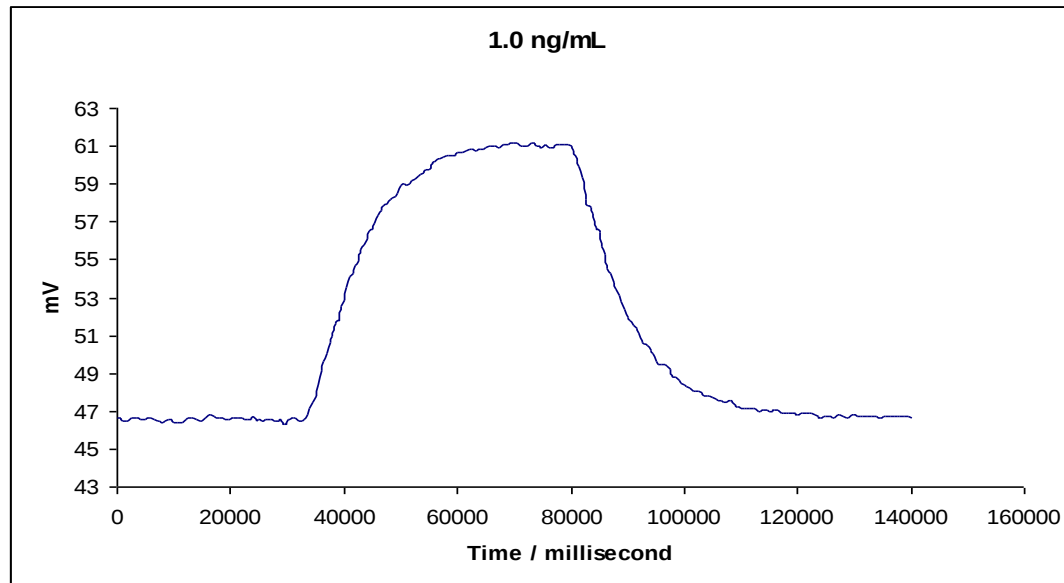
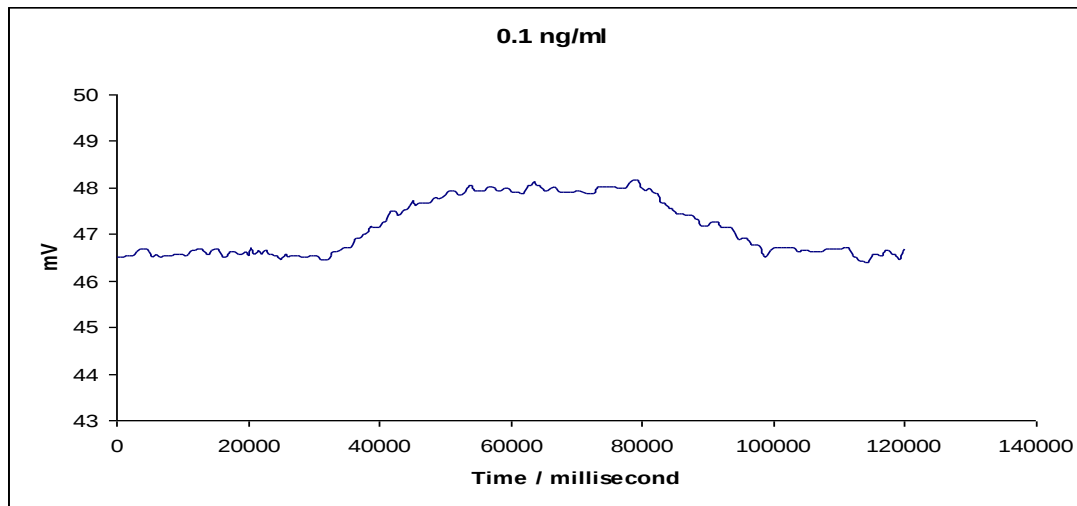
# Hg Analysis

## Principle of *Atomic* Fluorescence Spectrometry (AFS)



- 1) Bring sample into liquid form
- 2)  $\text{Hg}^{2+} + \text{Sn}^{2+} \rightarrow \text{Hg}^0 + \text{Sn}^{4+}$

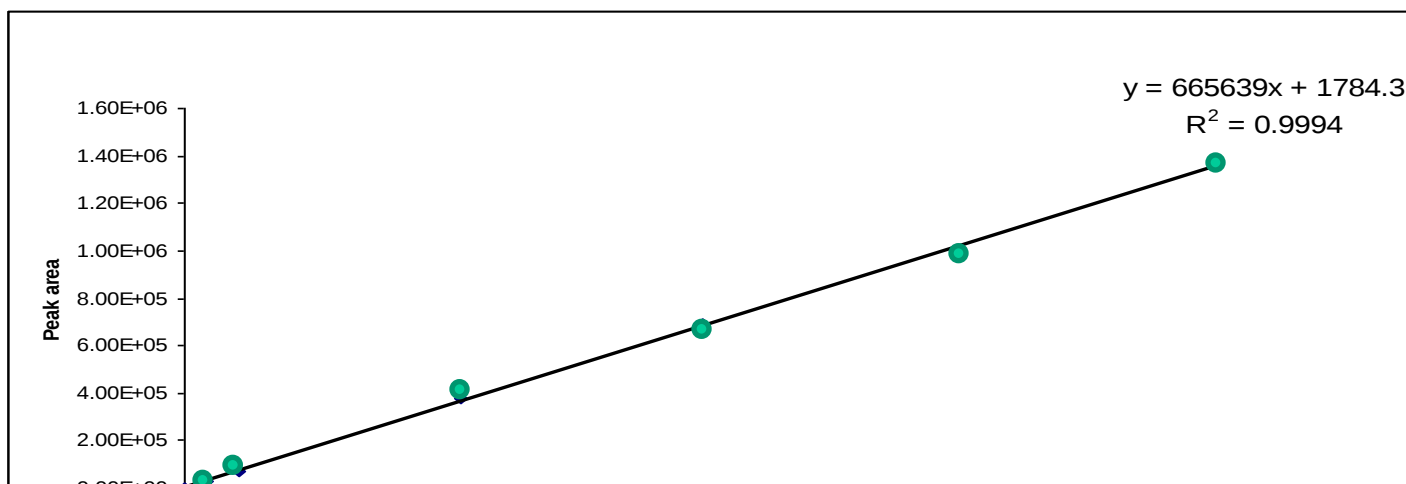
# Signal of 0.1 ng/mL and 1.0 ng/mL



# Instrument Calibration

Six standards points were prepared for calibration curve:

0.05 - 2  $\mu\text{g/L}$  in 5%  $\text{HNO}_3$



预览已结束，完整报告链接和二维码如下：

[https://www.yunbaogao.cn/report/index/report?reportId=5\\_14259](https://www.yunbaogao.cn/report/index/report?reportId=5_14259)

