



II. Hand-on Session: Comparative Flux Study

**Amnat Chidthaisong,
JGSEE, May 3, 2007**



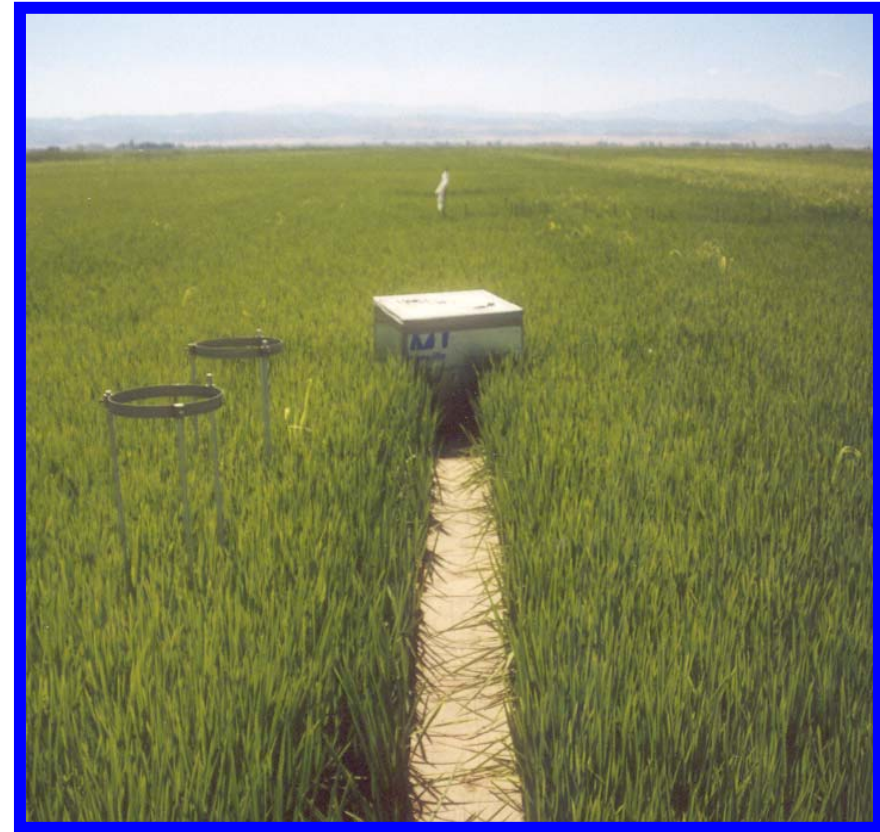
We will compare:

- Two detection techniques:
 - Online, semiconductor-based sensor
 - Gas Chromatography

Method for Emission Measurements



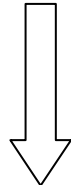
3 May 2007, Bangkok



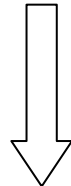
APN Workshop

Current Procedures

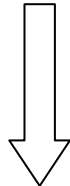
**Chamber
enclosure**



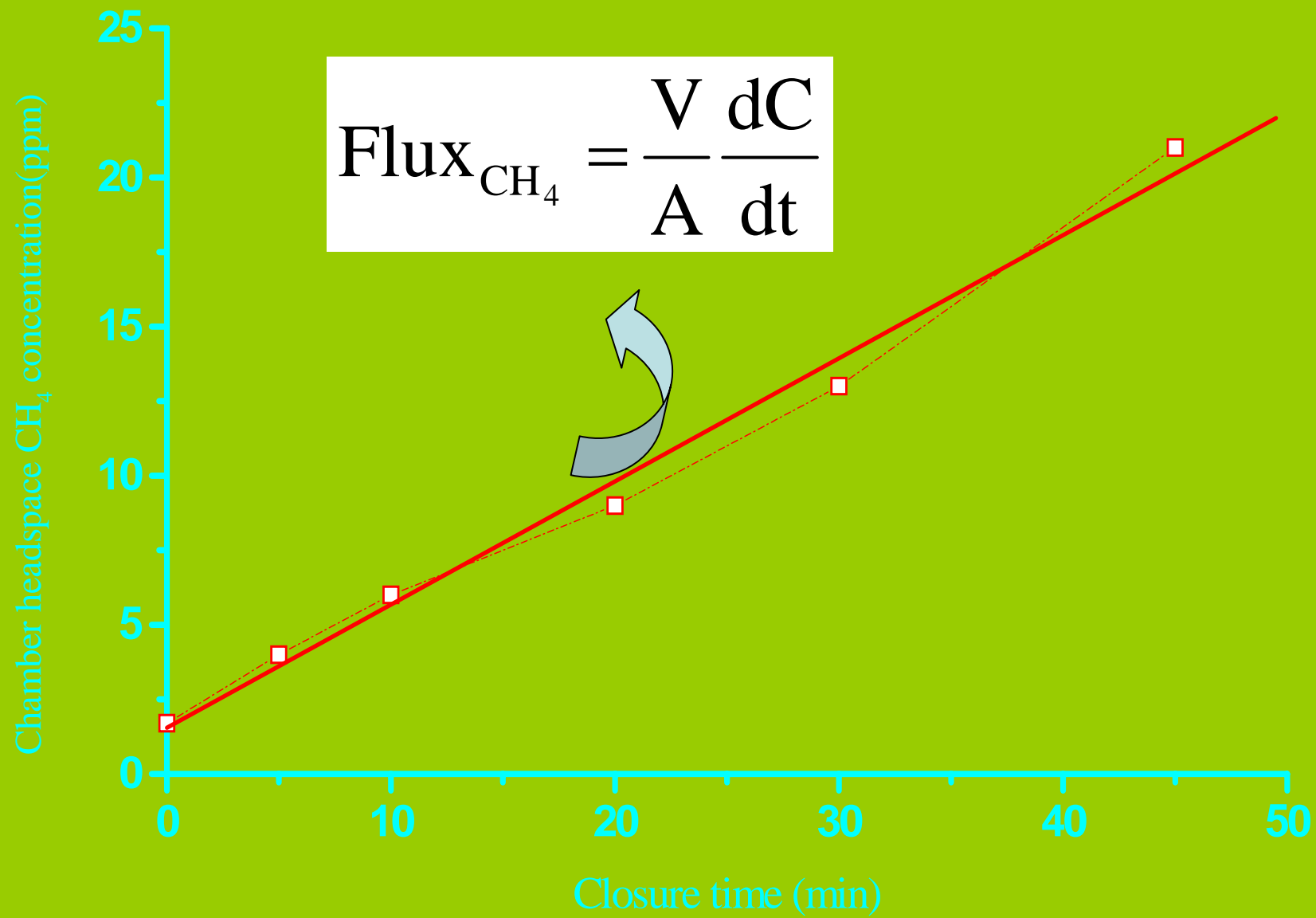
Gas samples



Gas Chromatography



Flux estimate



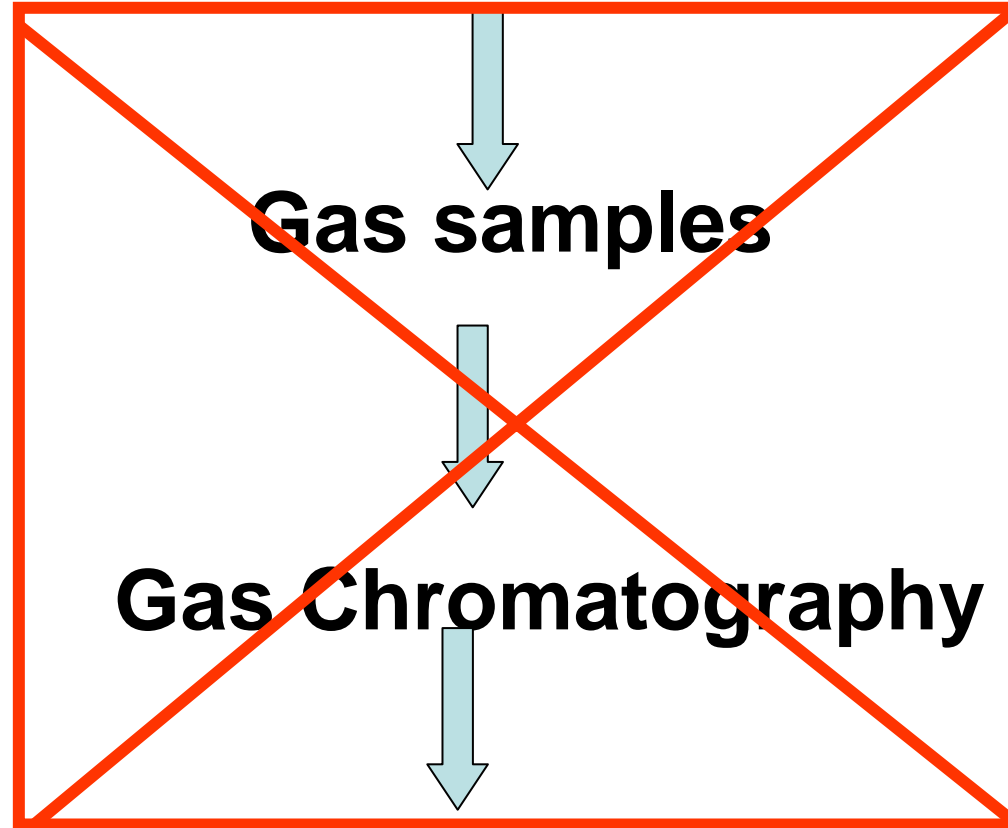
$$\text{Flux}_{\text{CH}_4} = \frac{V}{A} \frac{dC}{dt}$$



Drawbacks

- Time consuming
- Limited replication
- Expensive
- Accuracy concerns
- Not applicable in the remote area

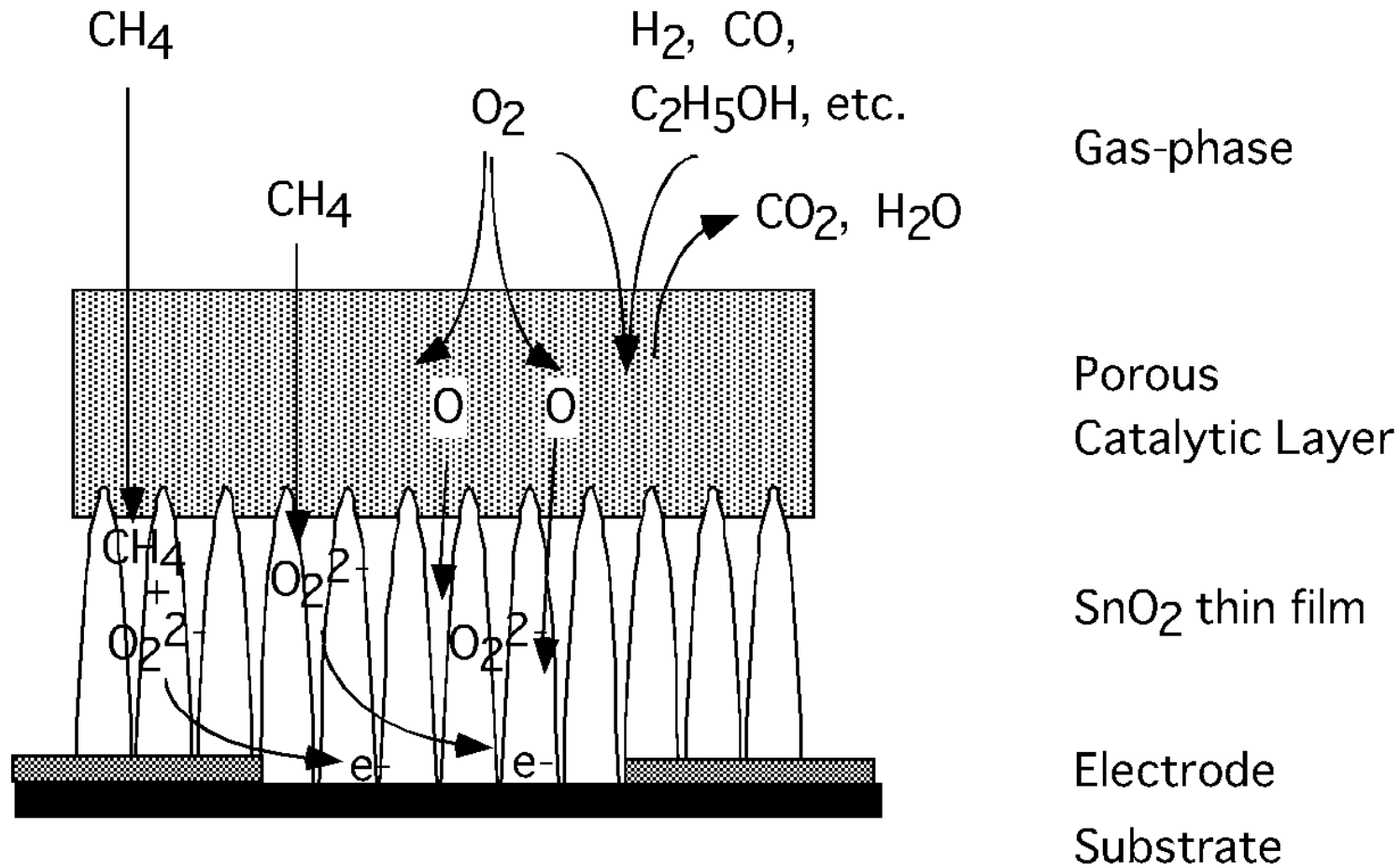
Chamber enclosure



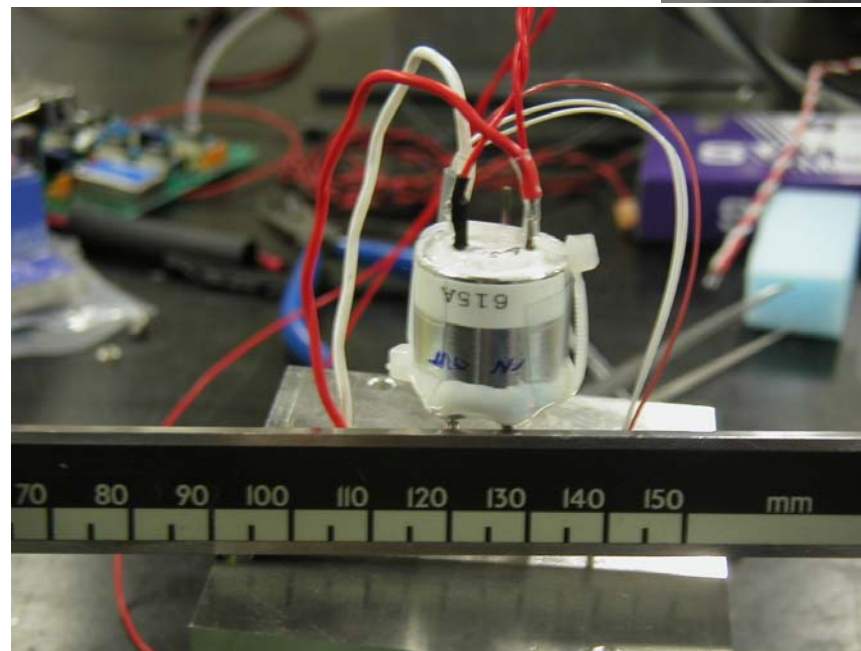
Gas Chromatography

Flux estimate

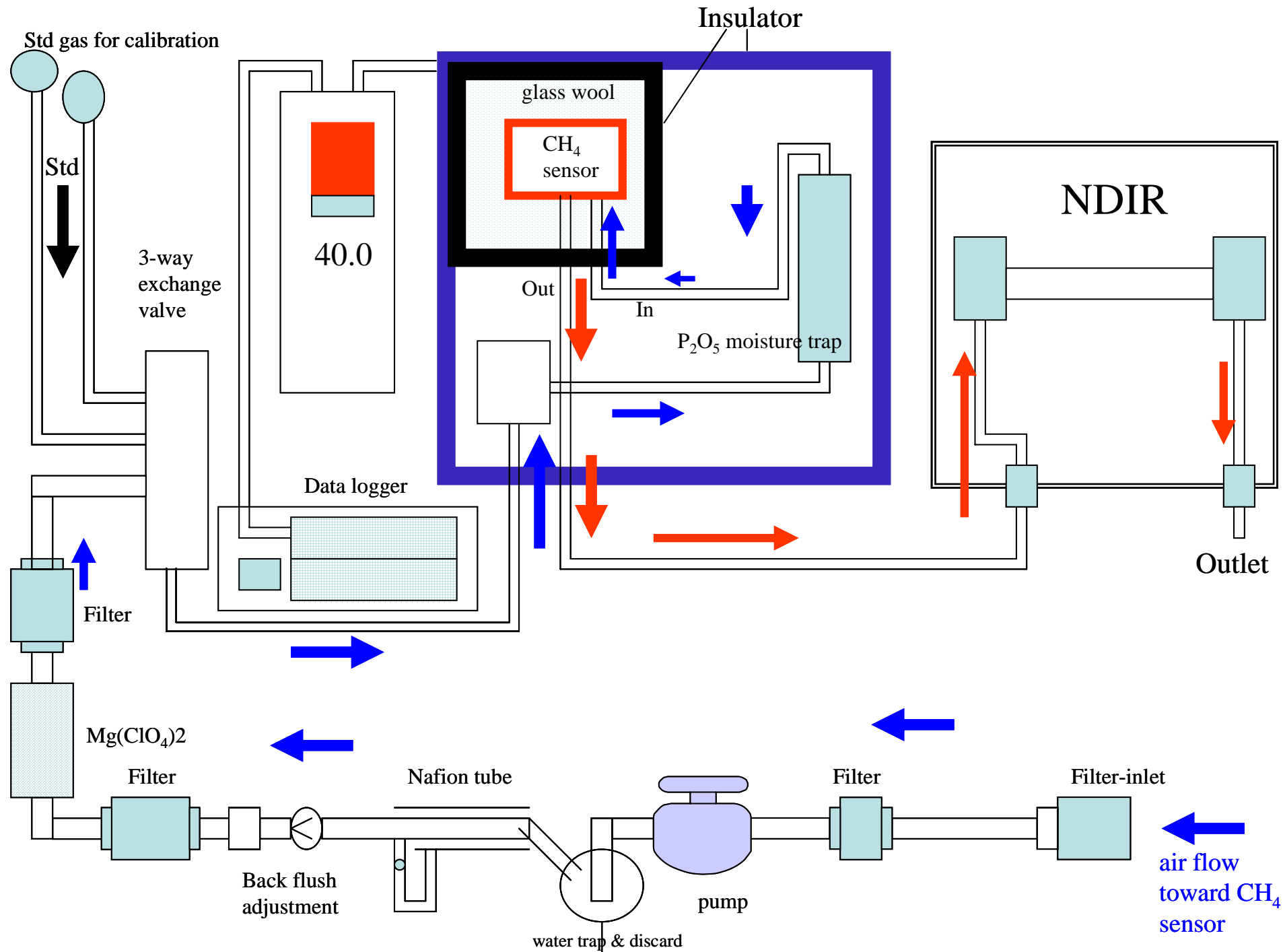
Sensing Mechanism



Conductivity is proportional to the amount of reduced gas
 $\text{R} + \text{O}_2^{2-} \rightarrow \text{RO} + 2e^-$ ions are released;

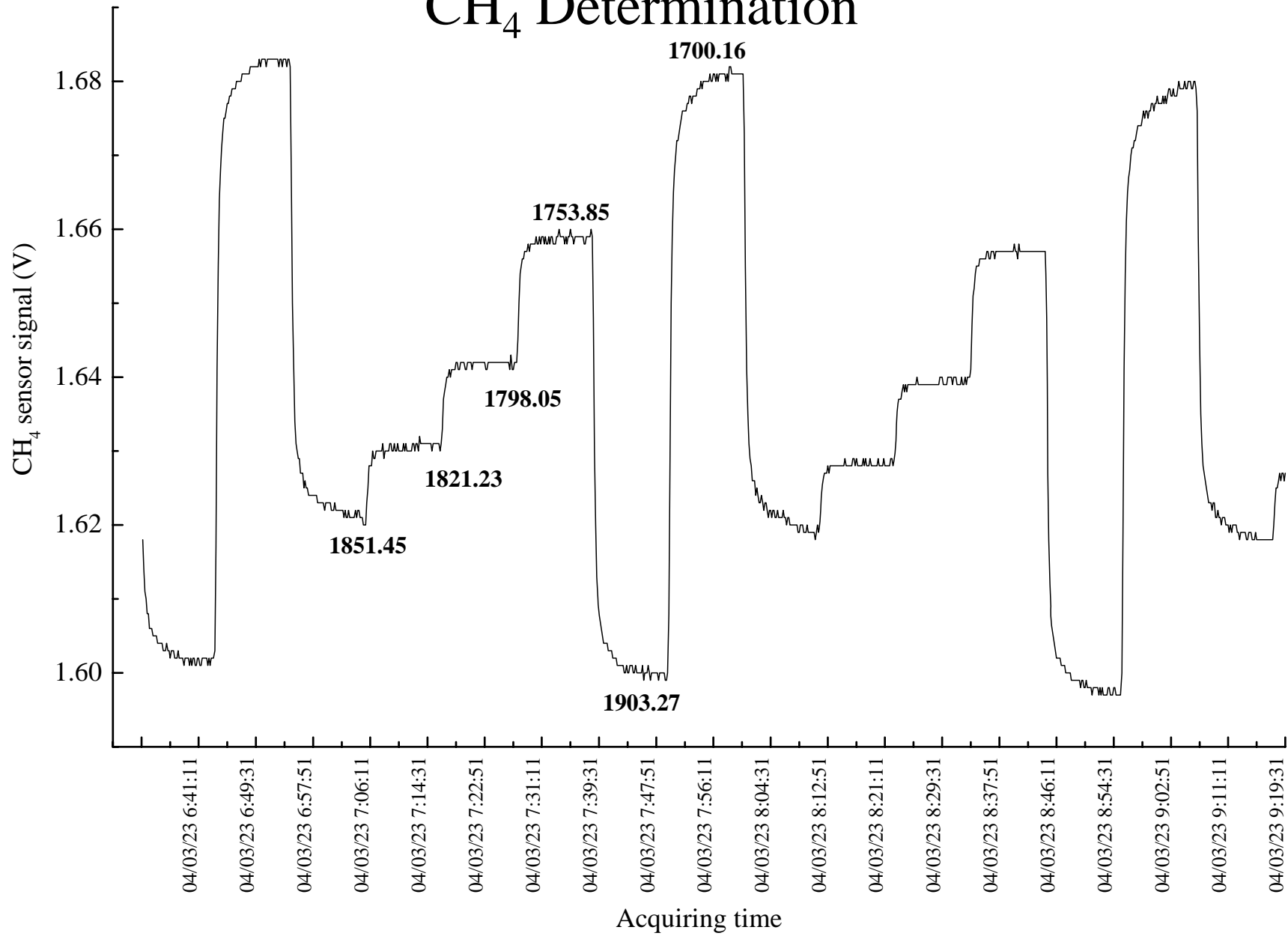


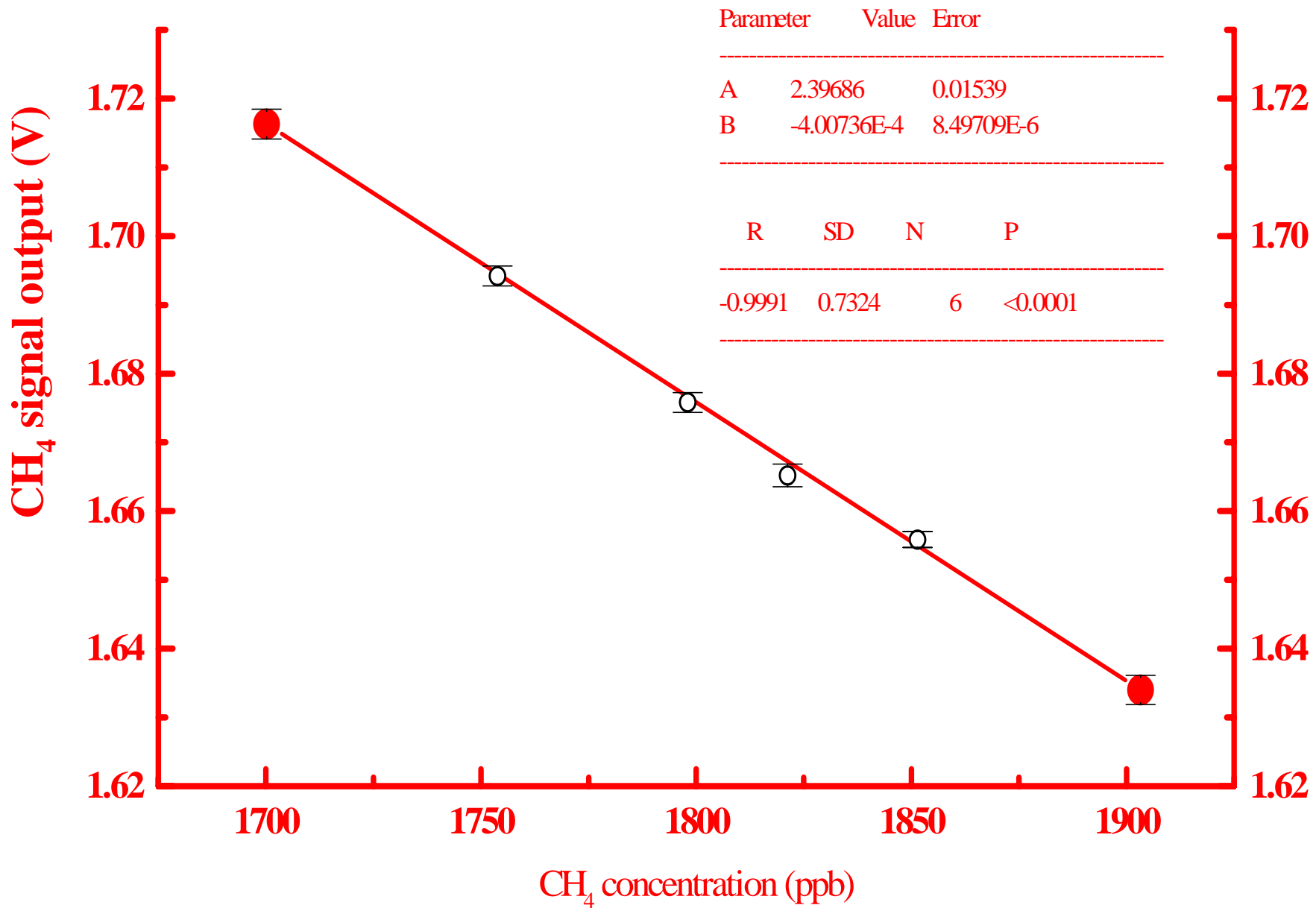
3 May 2007, Bangkok



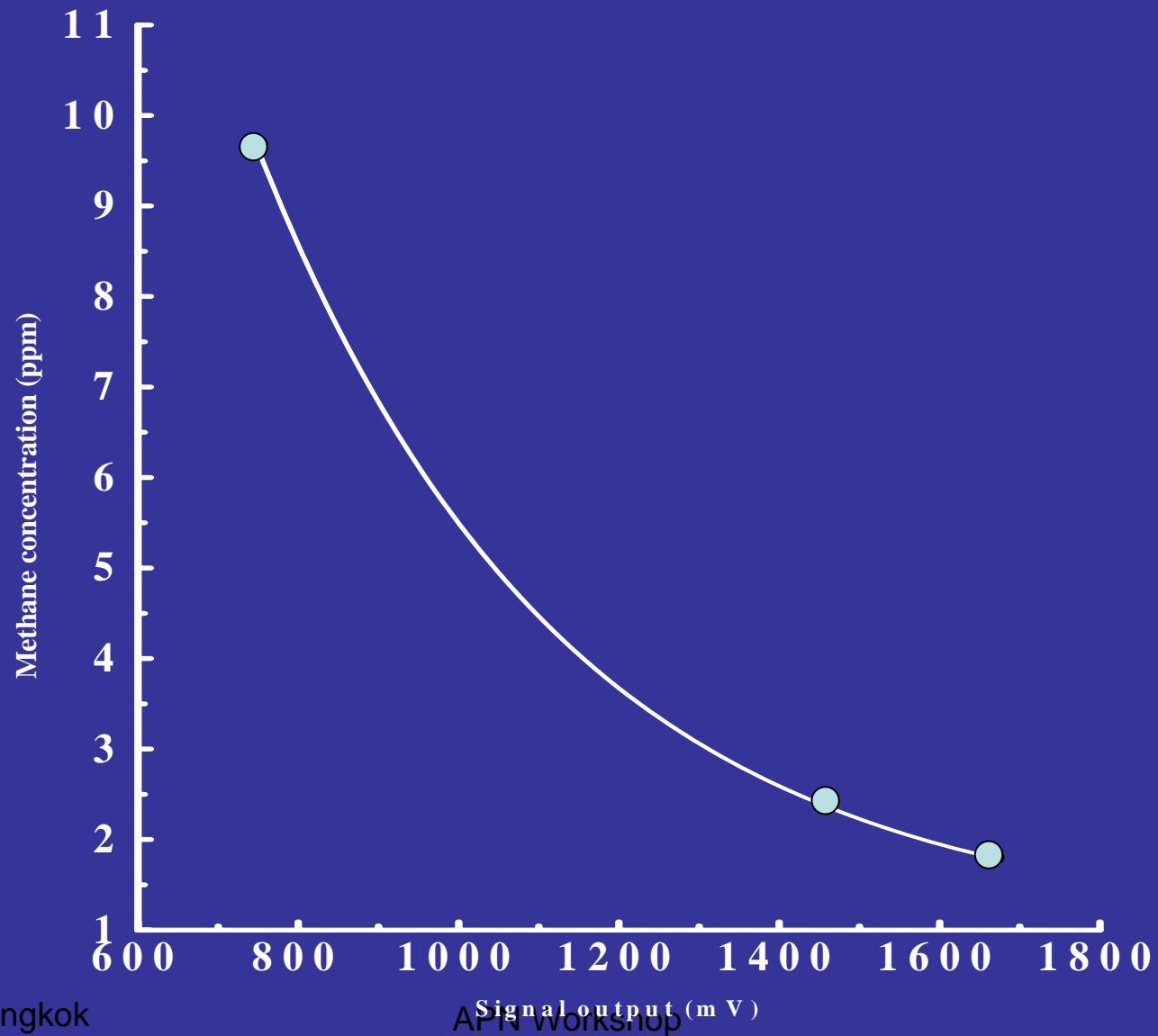


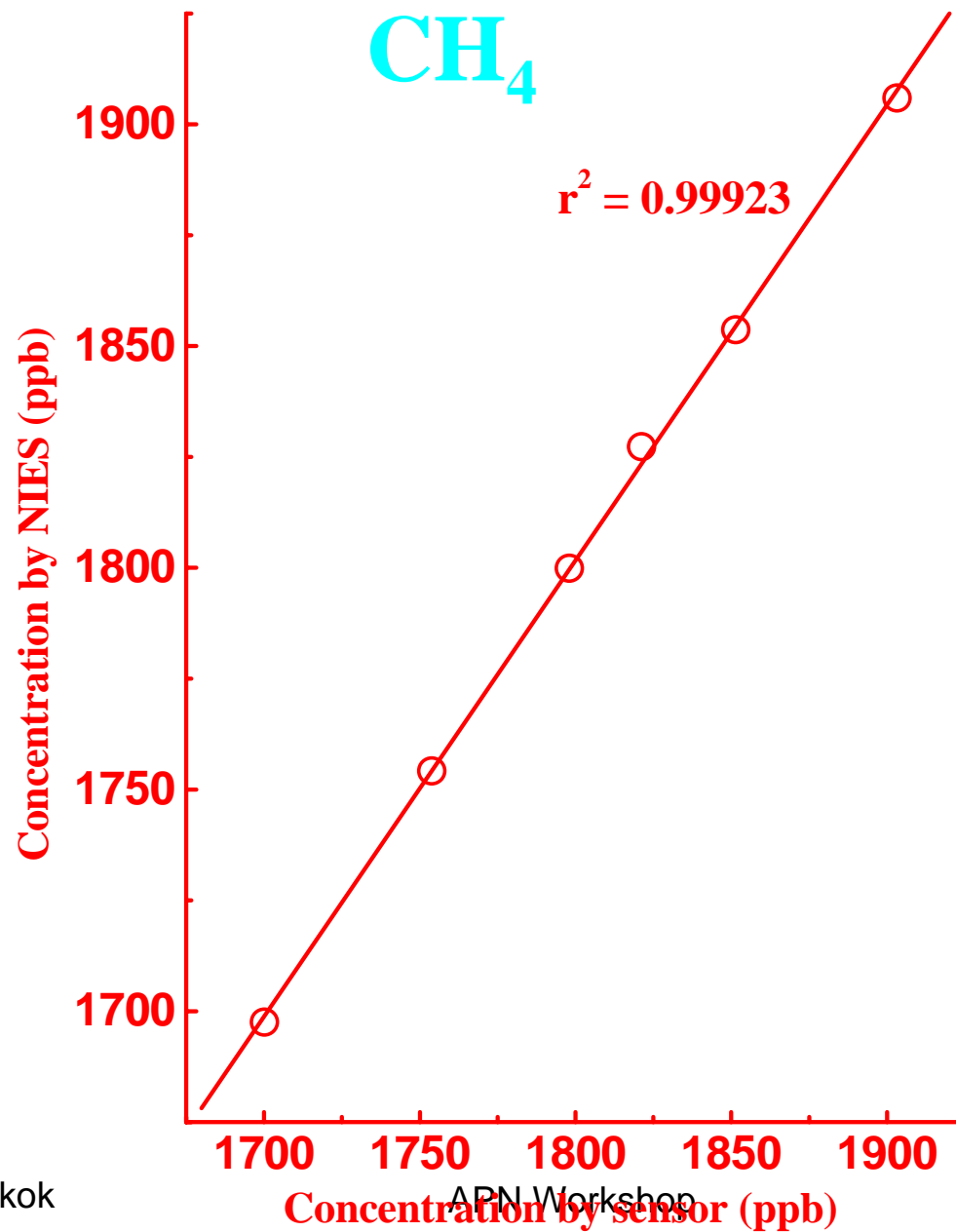
CH₄ Determination



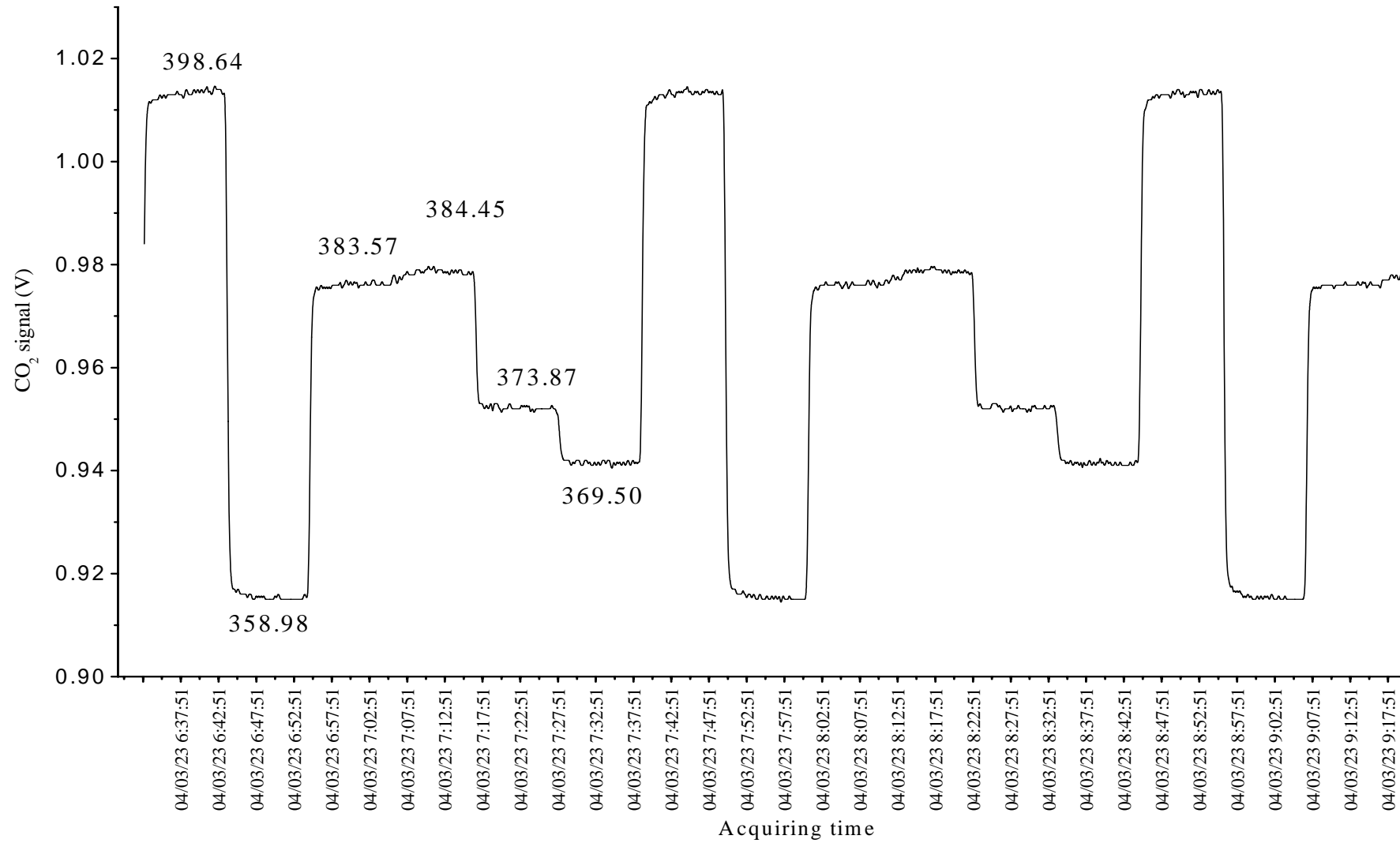


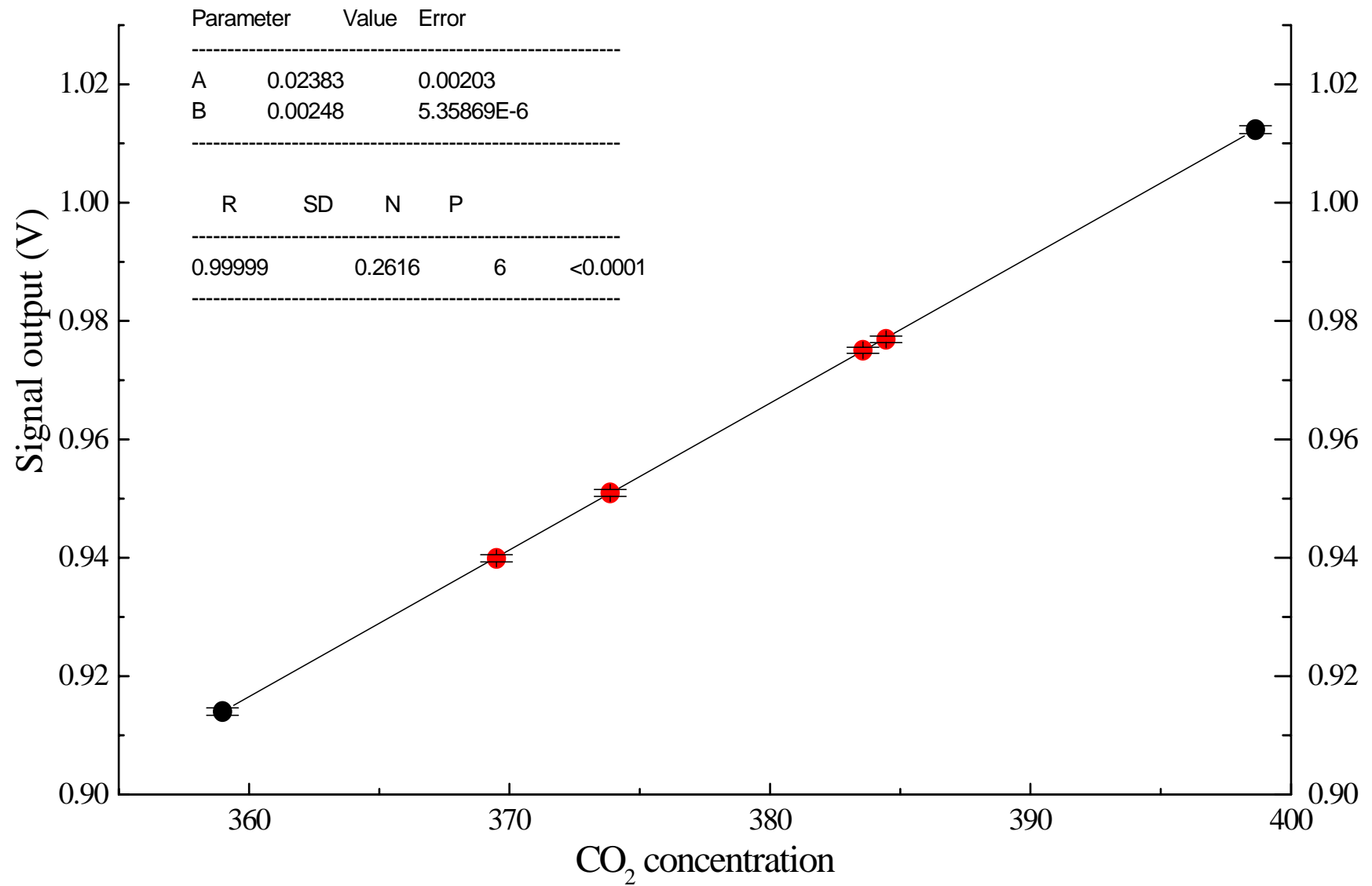
Measurement Range

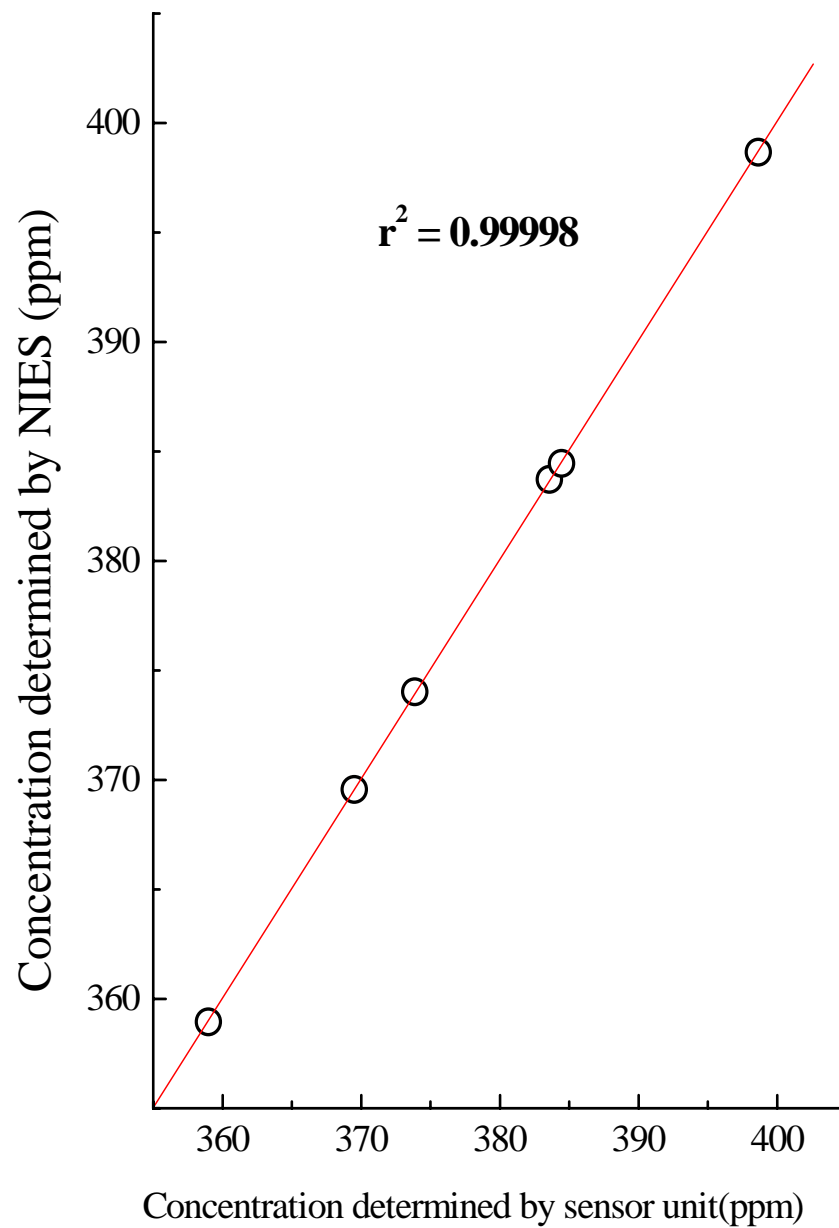
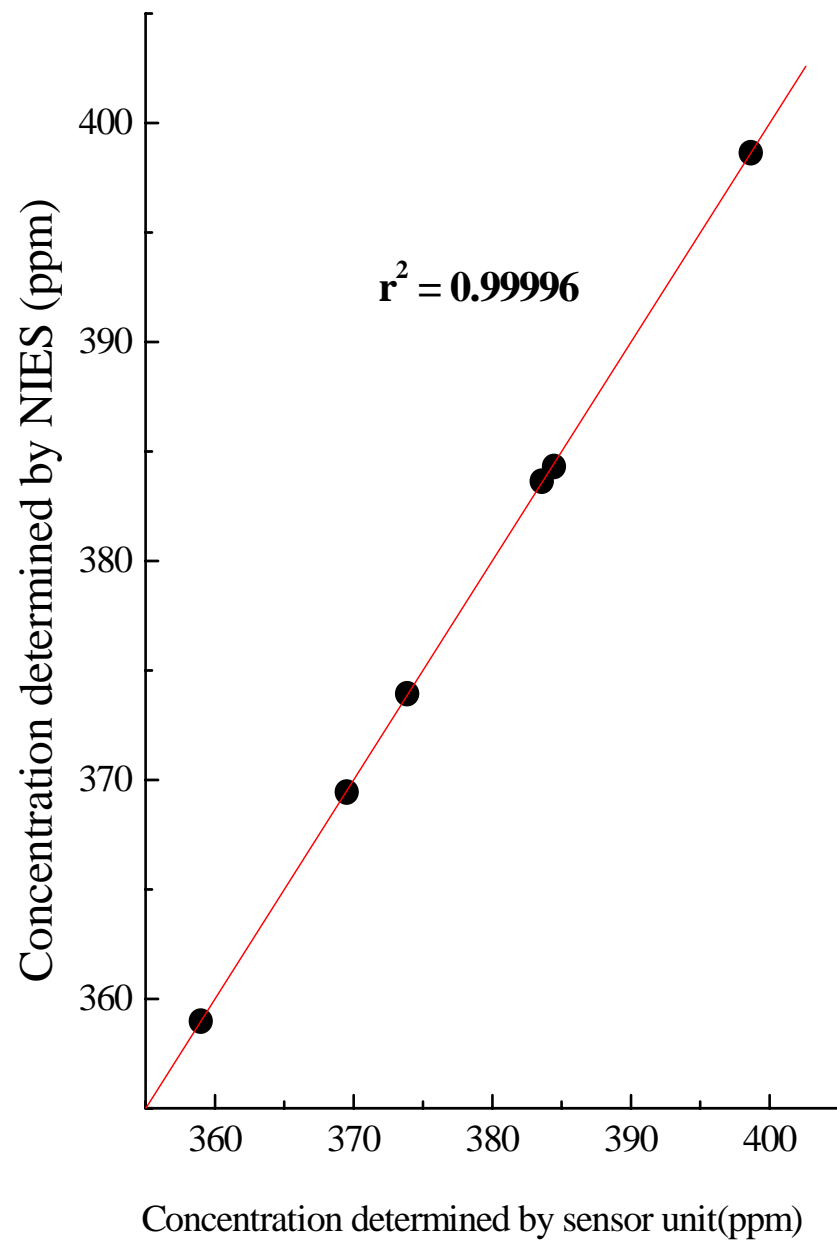




CO₂ Determination

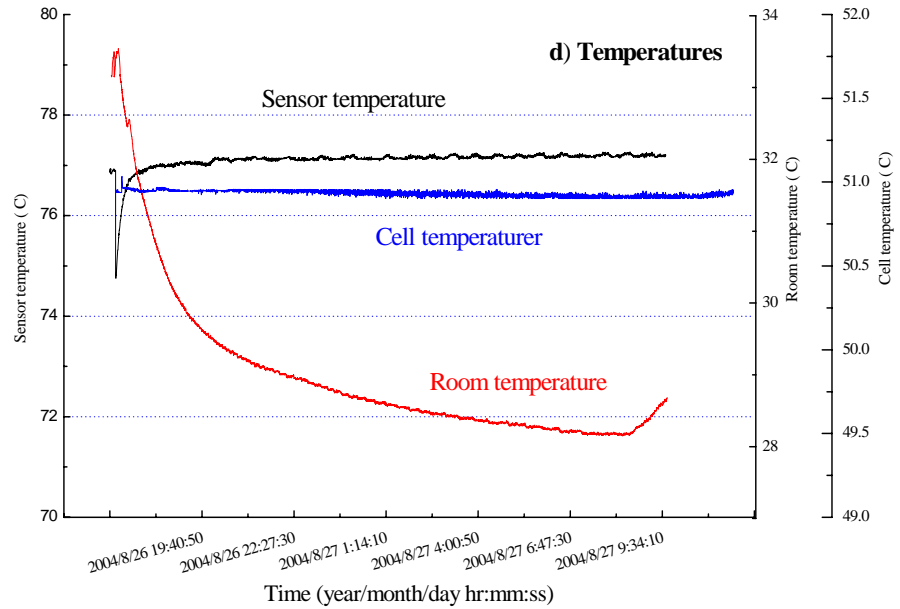
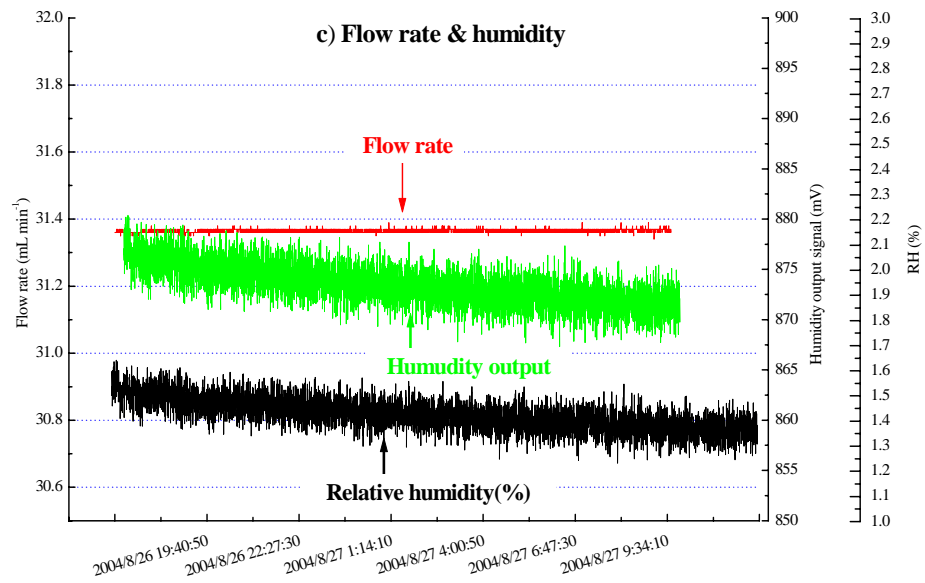
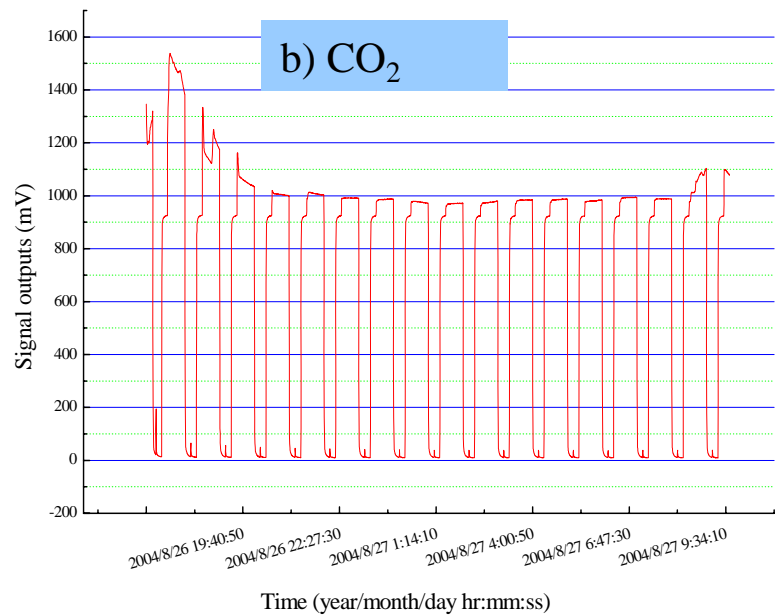
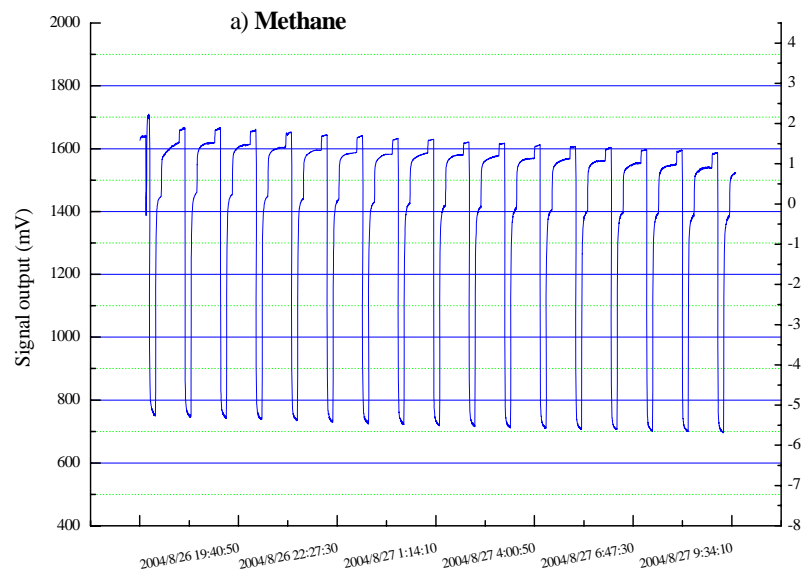


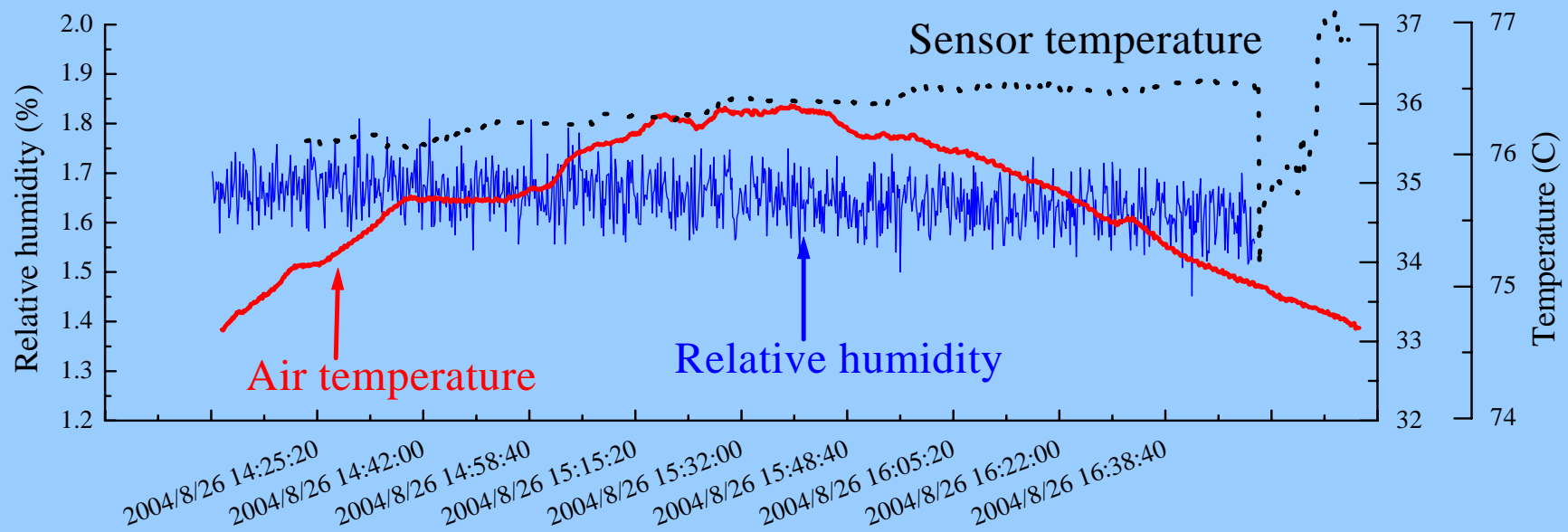
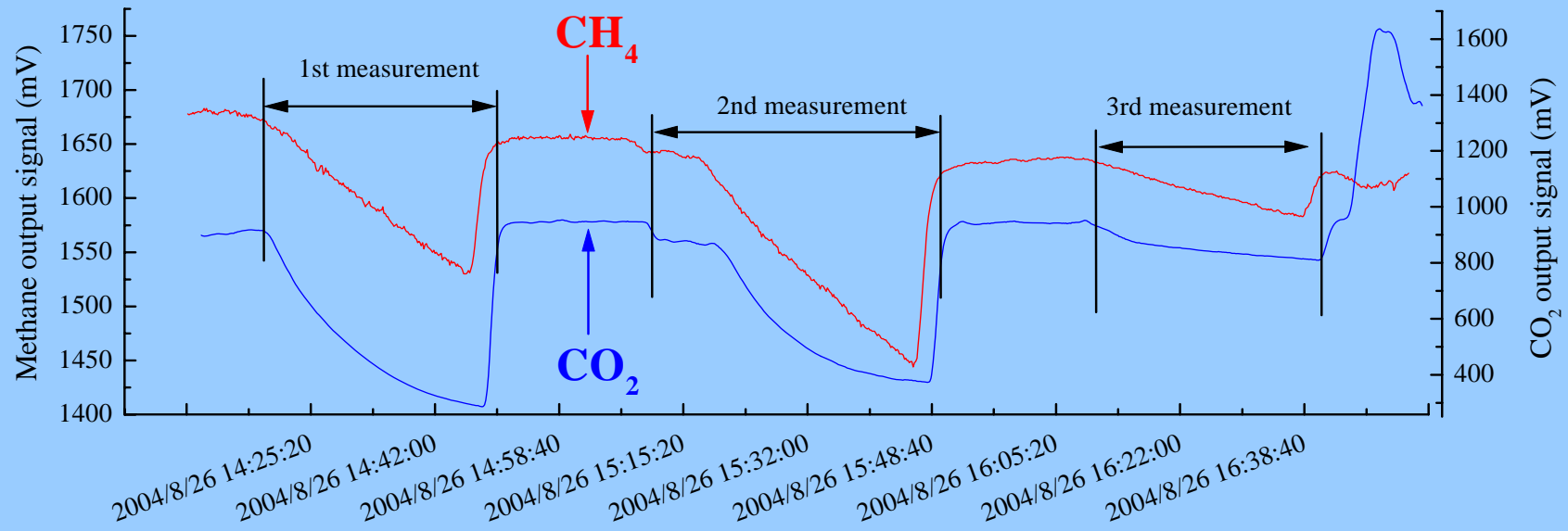




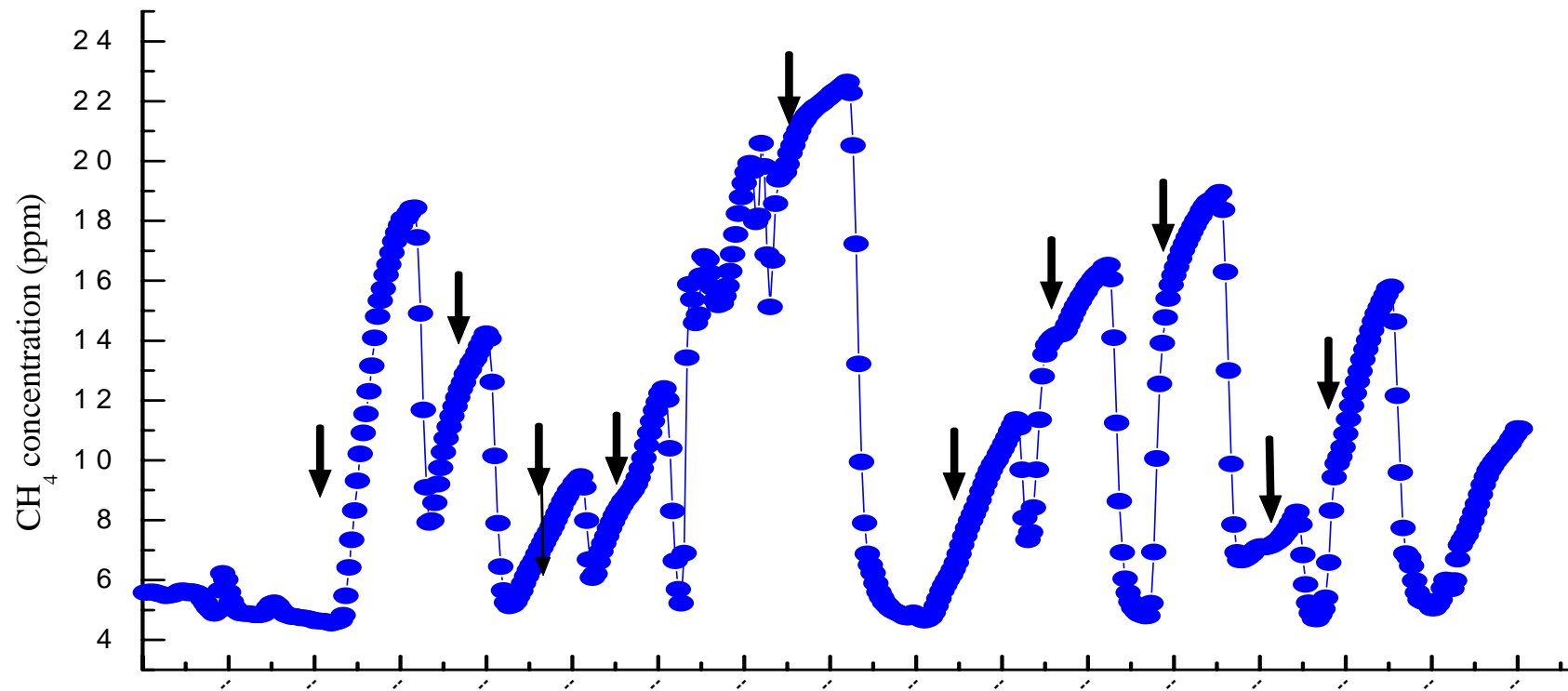




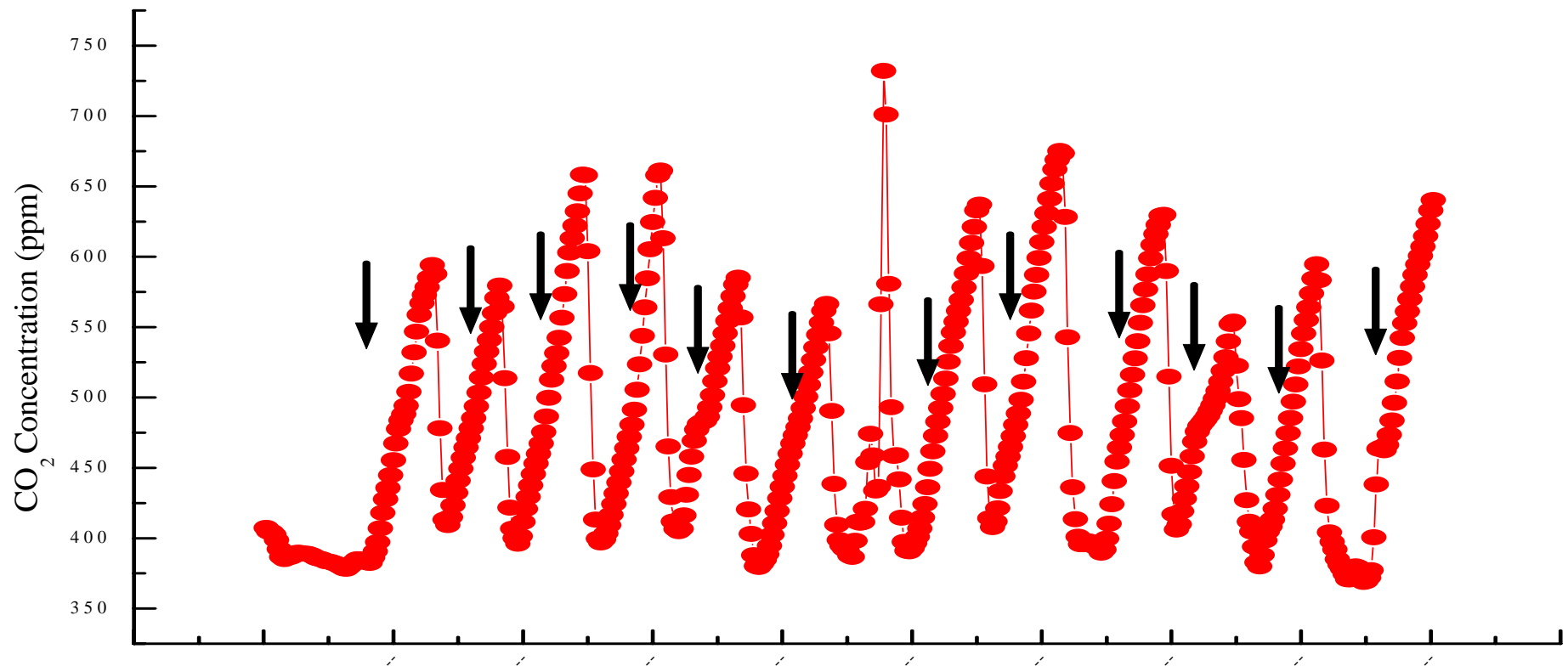




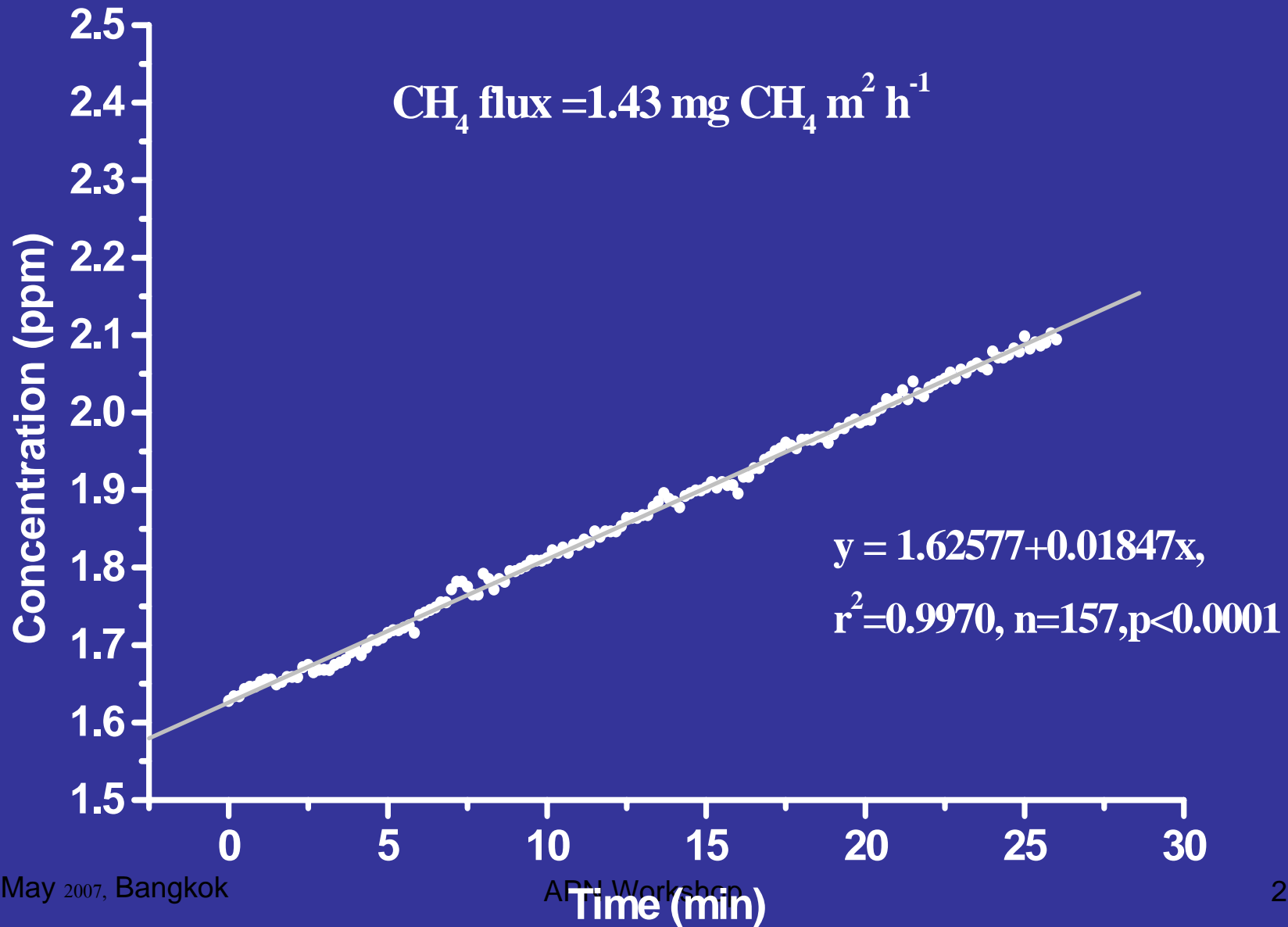
CH₄ measurements



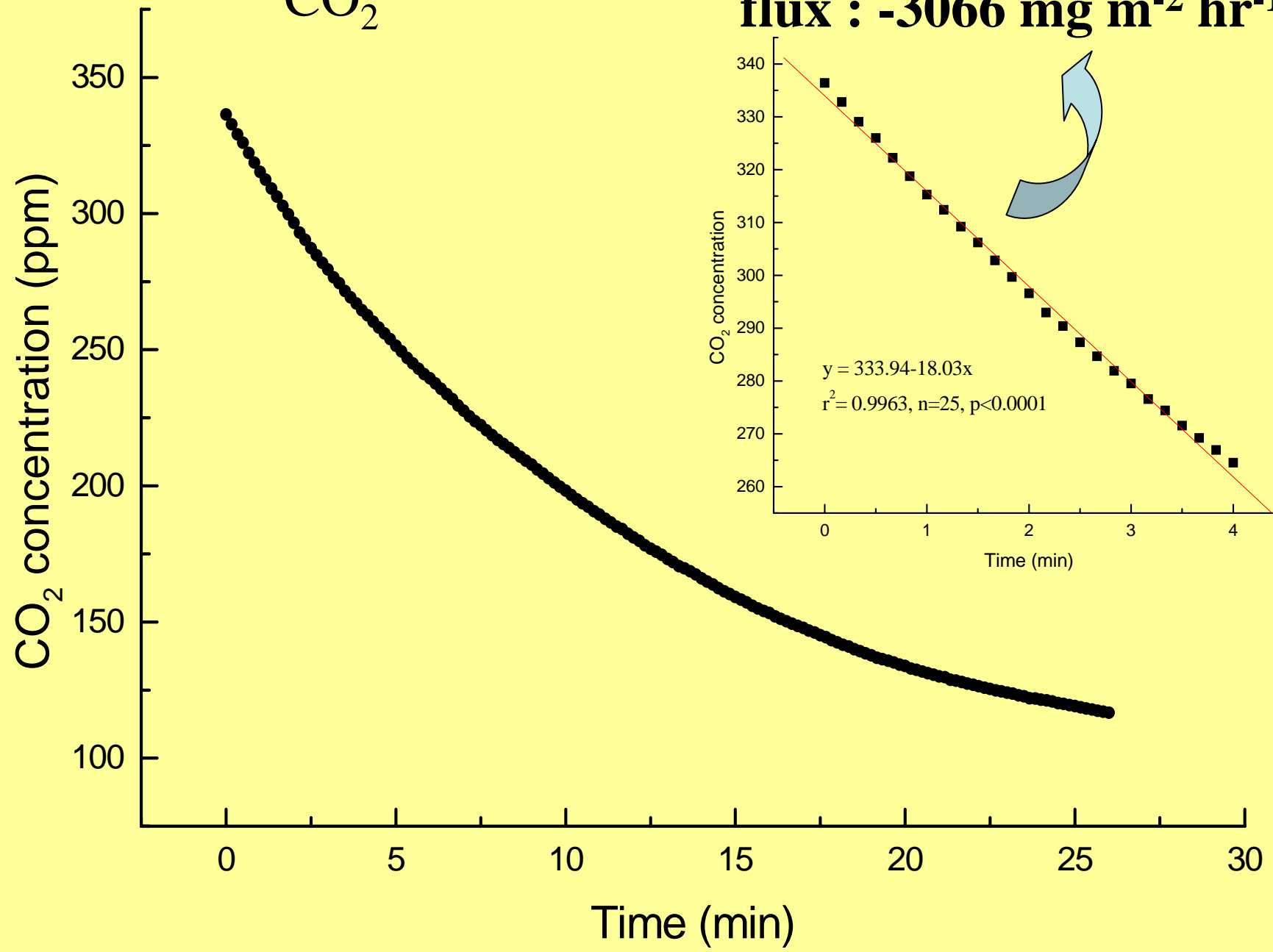
Measurement of CO₂



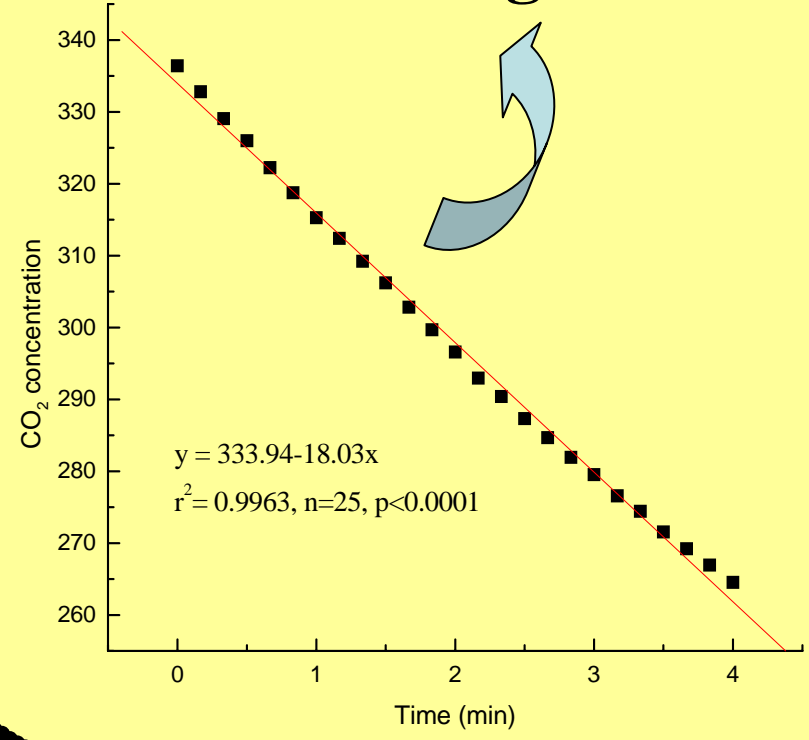
Methane Flux



CO₂

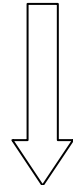


flux : -3066 mg m⁻² hr⁻¹

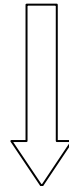


Determining CH₄ by GC

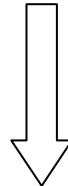
**Chamber
enclosure**



Gas samples



Gas Chromatography



Flux estimate

