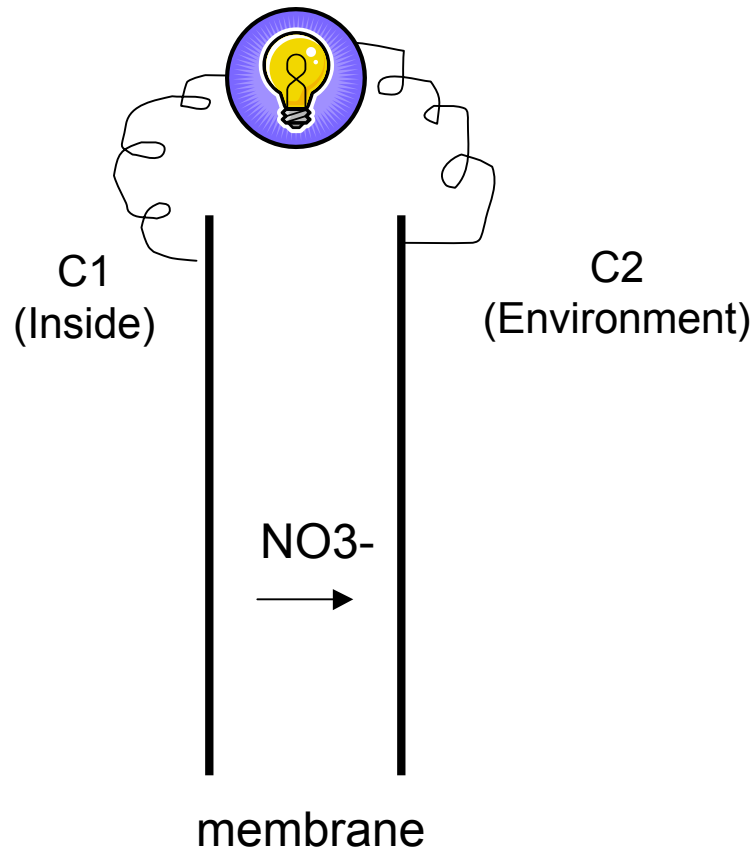

Nitrate & Ammonium Sensors

Kuni Kitajima
CCB, UCR

Ion Selective Electrode - Principle



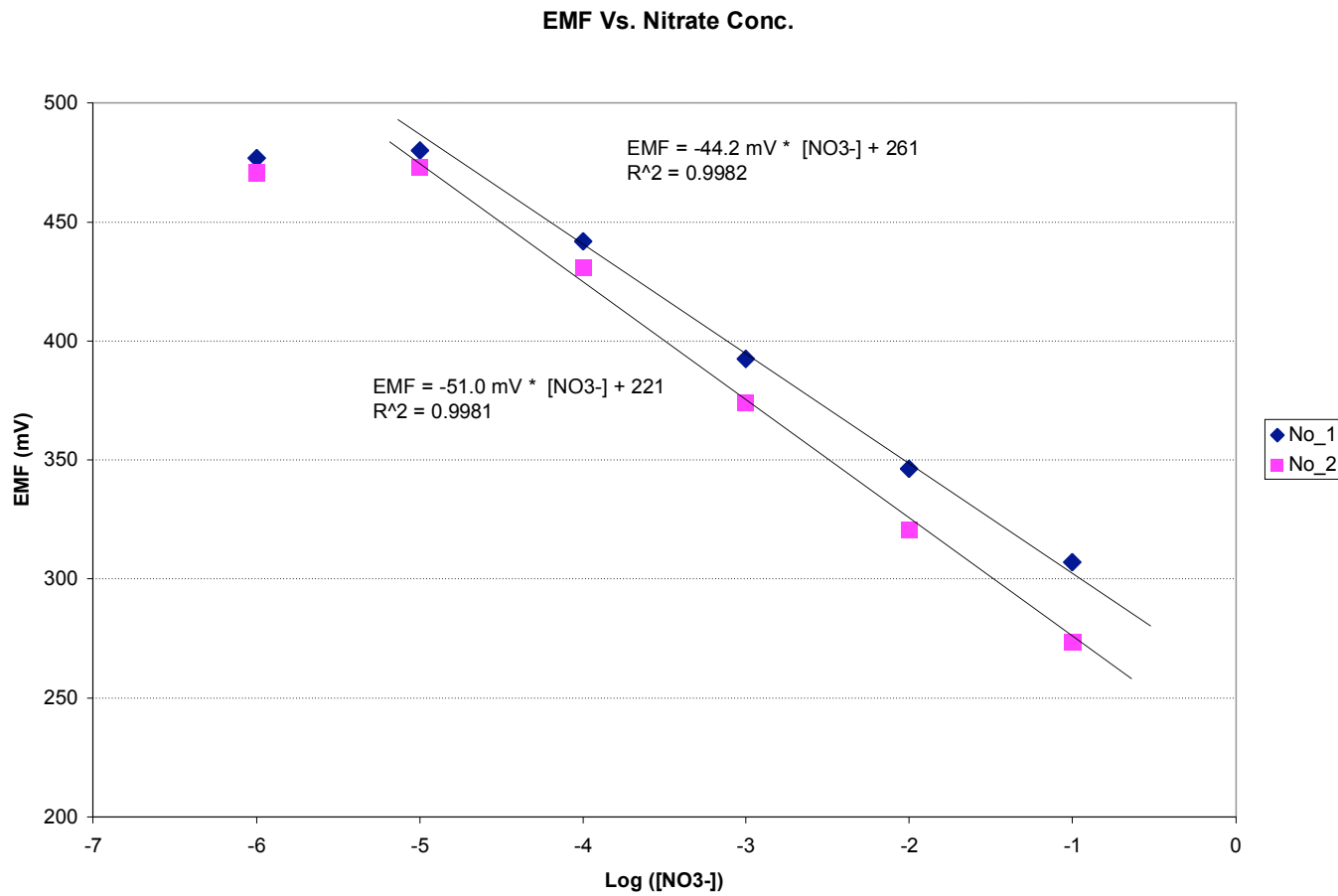
Nernst Equation

$$E \text{ (V)} = E_0 - \frac{RT}{nF} \log \frac{[\text{Environment}]}{[\text{Inside}]}$$

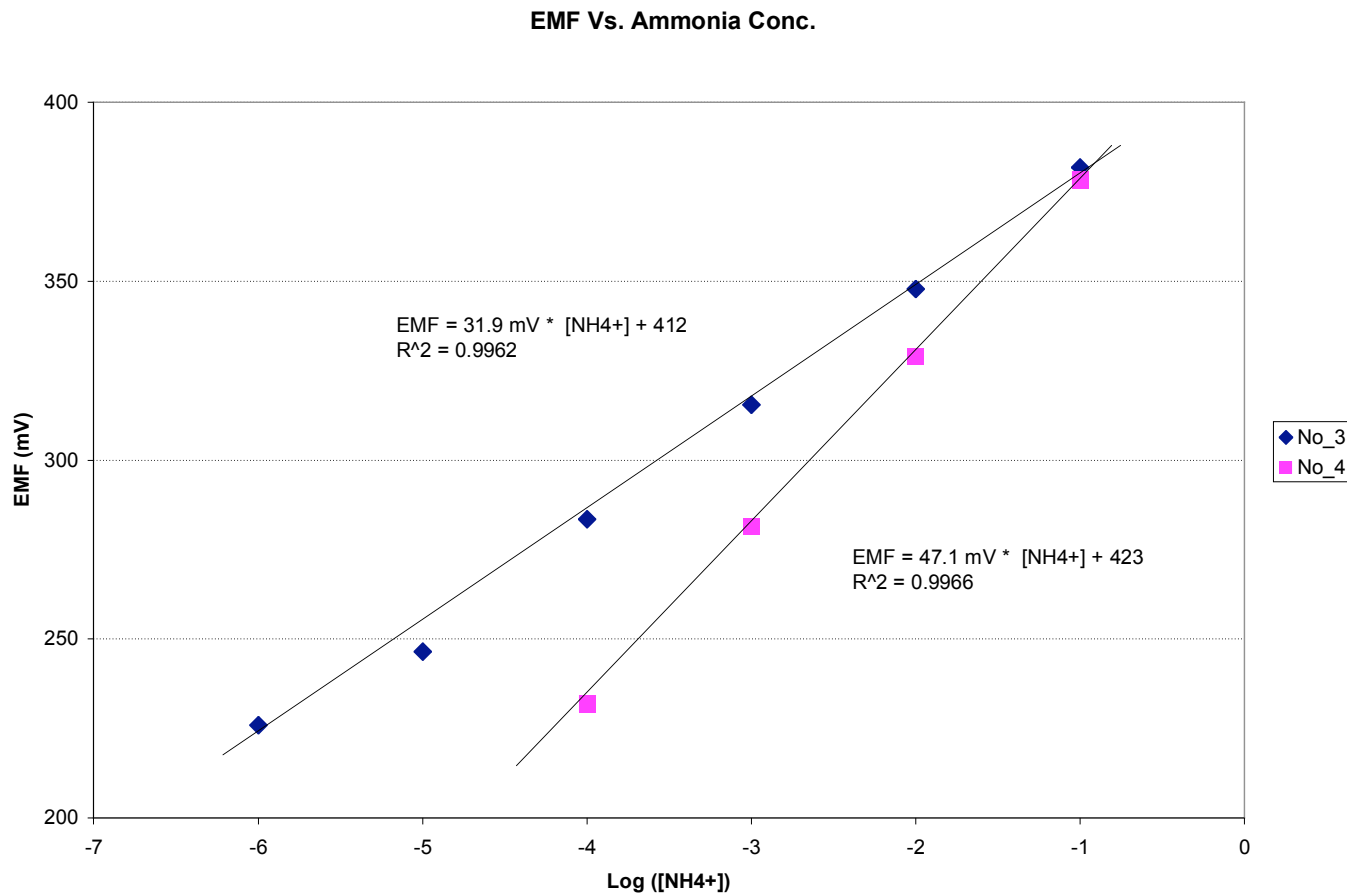
where R is gas constant,
T is temperature in K,
F is Faraday constant,
n is valence of ion.

Only one kind of ion can pass through the membrane
Slope should be 59.1 mV / dec
E is also a function of temperature

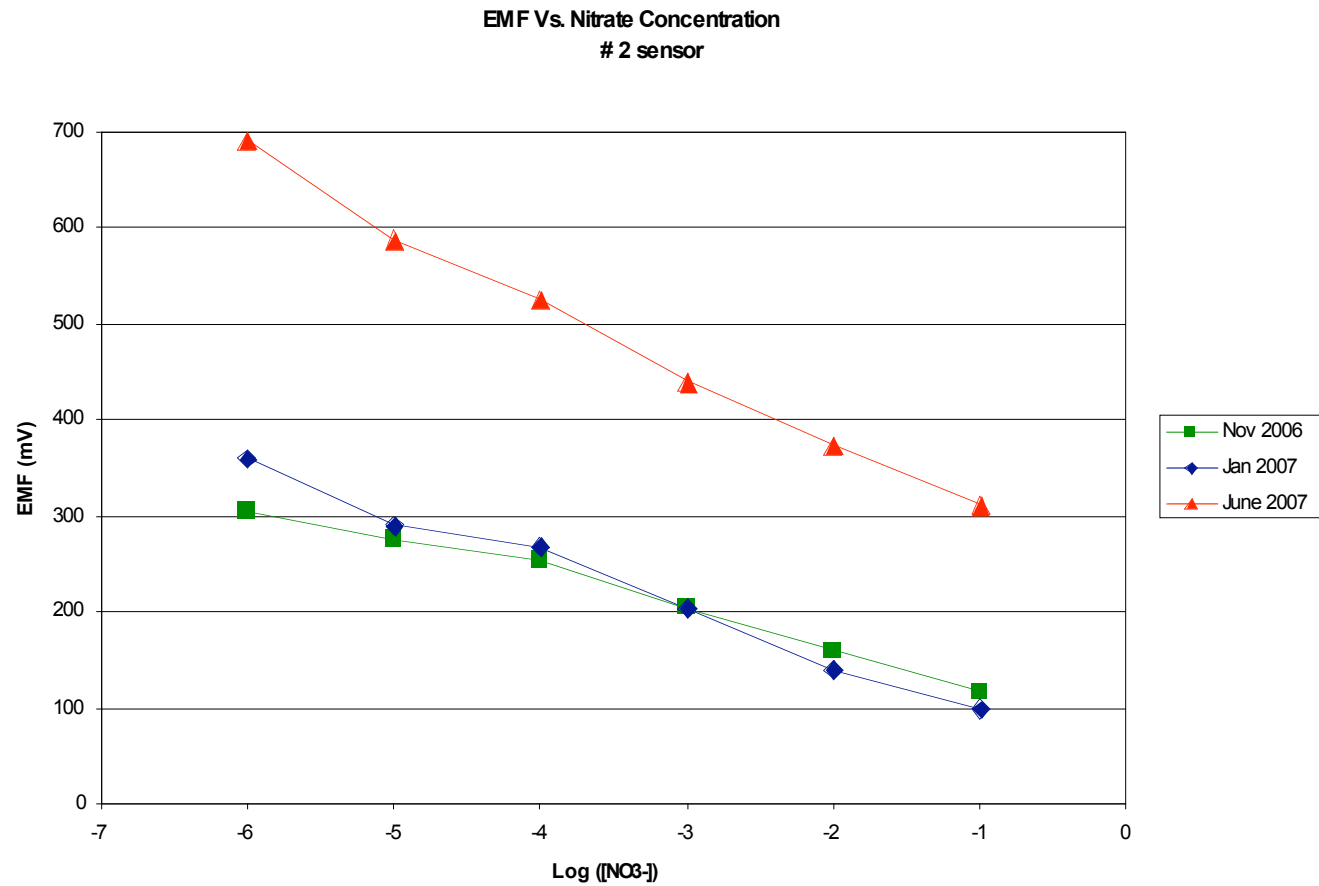
Calibration, Nitrate



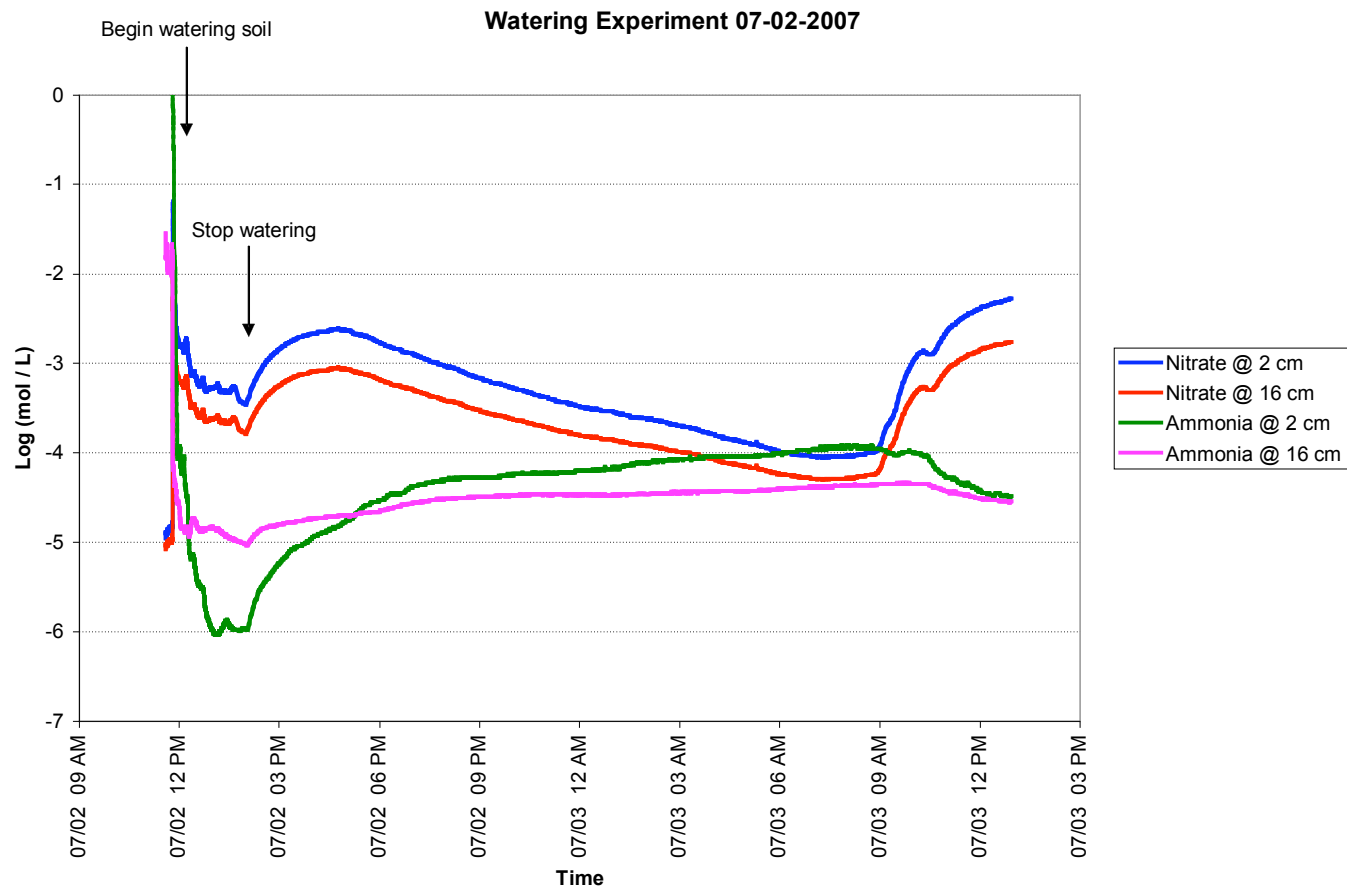
Calibration, Ammonium



Long Term Stability, Nitrate

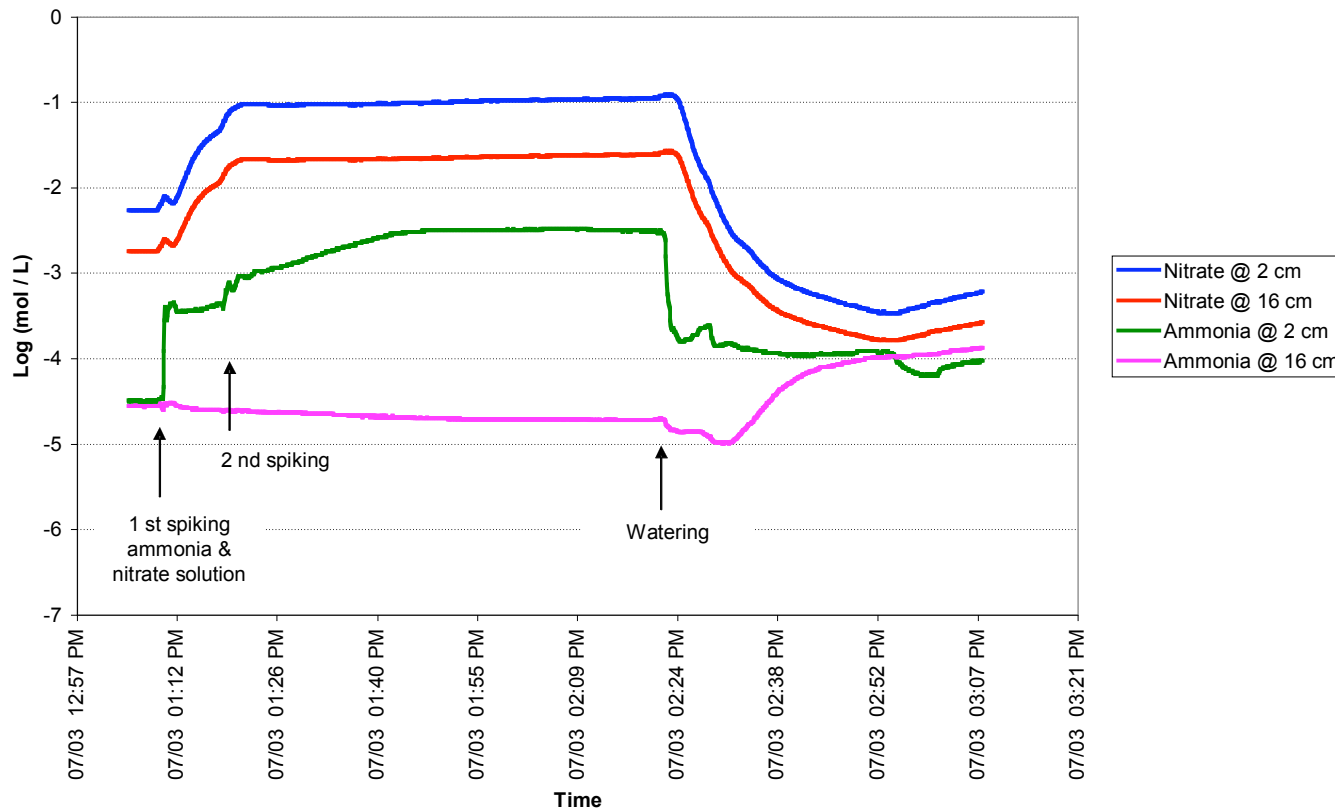


Watering Dry Soil



Spiking with Nitrate & Ammonium Solution Added 10^{-2} mol / L solution

Ammonia & Nitrate Spiking Experiment 07-03-2007



Effect of Temperature

