Ion Selective Electrodes in Hydroponic Culture

Currently, hydroponic growers rely on a combination of electrical conductivity and pH measurements in order to assess the quality and durability of their hydroponic nutrient solutions. However, many are unaware that hydroponic gardening can be much furtherly enhanced by the addition of ion selective electrodes.
In a certain sense, all hydroponic gardeners have used an ion sensitive electrode since the pH meter they use to measure the concentration of $H_3O(+)$ ions is actually selective to that ion. Imagine if every time you read pH you had interference from all the other ions present inside the hydroponic solution. Nonetheless, there are currently a large variety of ion selective electrodes available and many of them can be used in hydroponic gardening to accurately control the concentration of several elements.

For example, ion selective electrodes with very good selectivity and little interference exist for the nitrate ion. These type of electrodes can be purchased from many manufacturers but can be easily found here. For just 229 USD, the grower is able to accurately control the amount of nitrate ions present inside the hydroponic solution independently from other nutrients.

By measuring the potential difference given by the electrode when the solution is prepared, the grower is able to easily detect and graph changes within a certain growing period. Best of all, since the ion selective electrode gives a real measure of ion concentrations, the grower is able to resupply spent nitrogen without unbalancing the hydroponic growing solution.

Ion selective electrodes exist for a variety of ions including nitrate, ammonia, phosphate, potassium, iron and copper. This technology will prove to be the future of hydroponics as it

will guarantee the grower the ability to accurately control and resupply the exact amount of nutrients needed by his or her growing plants. These electrodes can also be easily wired to computer software in order to monitor nutrient use 24/7 (below a display of several ion selective electrodes)
_