

UNIVERSITY OF LOUISIANA AT LAFAYETTE

STEP Committee

Technology Fee Application

**Conductivity Meters in Chemistry Lab for
Education Majors.**

Title

Andrea Leonard

Name of Submitter
(Faculty or Staff Only)

Chemistry Department

Organization

Title: Conductivity Meters in Chemistry Lab for Date: 7/1/16
Education Majors
Name (Contact Person): Andrea D Leonard
Address: PO Box 43700 Lafayette, LA 70504
Phone Number: 337-482-5674 (337- Email: Leonard.chemistry@louisiana.edu
303-6958)
Department/College/Org: Chemistry

ABSTRACT (250 words or less):

CHEM 212 is the chemistry lecture and lab combination course required for many Education majors. The laboratory portion consists of instructor-designed, very simplified experiments designed for use in a non-college classroom. I would like to design two experiments for this course, but the chemical principles that I need to demonstrate require a Conductivity Meter to illustrate the level of electricity being conducted through water. The first experiment would show the difference between electrolytes and non-electrolytes dissolving in water and how the conductivity is affected. The second experiment will show that as the temperature of a solution increases, its capacity for dissolving more solute also increases. The Chemistry Department currently does not have a supply of low-tech Conductivity Meters for use in this fashion. I am requesting 12 Science First Conductivity meters to be used by the students in this laboratory course. These are simple, easy to use, small, and inexpensive. I believe they would greatly enhance the educational experience of the students.

Instruction Sheet:

CHEM 212 is the chemistry lecture and lab combination course required for all Early Childhood and Elementary Education majors. The goal of the lab portion of the class is to provide these future educators with hands-on experiences in the lab that they can directly take with them into the classroom. For that reason, these labs must be very simplified compared to the standard General Chemistry Laboratory (CHEM 115) class.

One of the experiments that I would like to design for this course is demonstrating the properties of water that change when an electrolyte is dissolved in the water. The Science First Conductivity Meters can be used very effectively to prove this point. A student will use the Conductivity Meter to test the level of electrical conductivity in a solution of salt (an electrolyte), tap water, and sugar (a non-electrolyte). The meters will show the large differences in conductivity between the three solutions quite obviously by observing the glowing green LEDs on the side of the meter.

Another experiment that I will be designing for these meters is to demonstrate the relationship between solubility and temperature for a solid dissolving in a liquid. These Science First Conductivity Meters will be used to test a saturated solution of salt in water at room temperature. Then, as extra salt is added to the solution, they will see that the solubility does not change, because no salt is dissolving in the water of the saturated solution. When we increase the temperature of the solution, they will see the conductivity increasing as the solubility increases at the higher temperature. Finally, they will watch the conductivity decrease as the solution is plunged into an ice bath.

These experiments will give students a great understanding of the chemical principles that will move them beyond the theory and into the real world. I believe they will greatly enhance the educational experience of the student. Unfortunately, these experiments are impossible to perform without Conductivity Meters. Currently we do not have such equipment in the Chemistry Department. These particular meters are desirable for their ease of use, small size, portability, and low price point.

I am requesting 12 Science First Conductivity Meters to meet the needs of the students that are required to take this course by their chosen major. If granted, they will be put into continuous use for students in the Fall and Spring semesters for the foreseeable future. I, Andrea Leonard, will store them in the Chemistry Stockroom, and I will be responsible for their safekeeping. This room is always kept locked when stockroom personnel are not present. Although they will be used primarily for the CHEM 212 laboratory portion, research is being done to try to integrate their use into other chemistry lab courses.

Budget Proposal

1.	Equipment	
	12 Science First Conductivity Meters	12 x \$29.95 = \$359.40
	Shipping	1 x \$35.94 = \$35.94

TOTAL: **\$395.34**