

EQUIPMENT NEEDS ASSESSMENT APPLICATION
Fall 2019

Name of Person Submitting Request:	Jessy Lemieux
Program or Service Area:	Chemistry
Division:	Science
Date of Last Program Efficacy:	2016
What rating was given?	Continuation
Equipment Requested	pH Electrodes
Amount Requested:	48 at \$79 each, \$3792 total
Strategic Initiatives Addressed:	2. Student Success
Needs Assessment Resources (includes Strategic Initiatives):	https://www.valleycollege.edu/about-sbvc/campus-committees/academic-senate/program-review/needs-assessment.php

NOTE: To facilitate ranking by the committee, submit separate requests for each item; however, multiple items can be submitted as one request if it is required that the equipment is packaged together.

Replacement ☒ Additional ☐

Are there alternative funding sources? (for example, Department, Budget, Perkins, Grants, etc.)

Yes ☐ NO ☒

If yes, what are they? _____

1. Provide a rationale for your request. (Explain, in detail, the need for this equipment.)

pH electrodes are a vital piece of instrumentation for second semester General Chemistry, CHEM 151, and Quantitative Analysis, CHEM 205 labs where accurate measurements of pH over time are essential portions of the lab curriculum. According to Vernier, the manufacturer of the pH electrodes that we and many other instructional chemistry labs use:

“The accuracy and response times of pH Sensors change as they age. While a well-maintained pH Sensor will work well for many years, it will need to be calibrated more frequently as it gets older. If your pH Sensor is very old (5+ years old), it may need to be calibrated before each use. At some point the probe will no longer read accurately, whether or not it has been calibrated.”

<https://www.vernier.com/til/3311/>

Most of our pH electrodes are approaching the end of their useful lifetimes and are becoming very difficult to calibrate. Inaccuracies in the pH measurements significantly hamper instruction. In CHEM 151 one of the SLOs is “Students will analyze equilibrium systems, including acid-base chemistry and titrations, to determine numerical parameters such as pH and K_c, and make predictions about equilibrium changes based on Le Chatelier’s principle.”

Accurate pH electrodes are essential for studying aqueous acid/base equilibrium in the CHEM 151 lab setting. If the students are not becoming proficient in accurately collecting this data at the CHEM 151 level, then achieving this SLO for CHEM 151 becomes increasingly difficult.

2. Indicate how the content of the department/program's latest Efficacy Report and/or current EMP supports this request and how the request is tied to program planning. *(Directly reference the relevant information from your latest Efficacy Report and/or current EMP in your discussion.)*

A goal of the last efficacy report and the current 2018-19 EMP is to increase the number of degrees awarded in Chemistry (which have increased to 12 – 14 in the past three years, compared to 7 – 8 in the two years prior). As we have increased the offerings of majors' prep courses over the years, in response to demand, the pH electrodes utilized by this sequence of classes has undergone increased use and is now beginning to break down.

If we are to continue to provide first-rate laboratory-based education, which is necessary for students to succeed in the competitive disciplines of science majors requiring Chemistry, we will need to begin to replace these instruments, with those that include functioning software. *(Efficacy report, page 34).*

3. Indicate any additional information you want the committee to consider *(for example, regulatory information, compliance, updated efficiency, student success data, planning, etc.)*.

CHEM 151 is an essential lower division science course for all science majors preparing for transfer and accurate pH electrodes are important tools that are ubiquitous in second semester college General Chemistry courses. We must begin phasing-in the purchase of new pH electrodes, in order to continue to offer the first-rate laboratory experiences that the 4-year transfer institutions expect out of our students.

4. Indicate any related costs (including any ongoing maintenance or updates) and department/program's plans to support those costs.

pH electrodes have a finite lifetime of approximately 5 years assuming proper care. Besides that, there are no maintenance costs.

5. What are the consequences of not funding this equipment?

Without funding, the pH measurements made in the lab will fall in quality over time. Inaccurate data will ultimately make interpretation of the data increasingly difficult, reducing the instructional quality of our chemistry labs.