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A Proposal of Educational Robotics Applied to Teaching Acid-Base Titrations

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Highlights

A proposal to use educational robotics to teach was implemented

Through connections between pH module, peristaltic valve and Arduino® platform, a potentiometric titration is operated automatically

Resumo/Abstract

This study had as focus the construction of an automatic titrator of low cost and easy acquisition (Figure 1). For that, the *Open Source* Arduino platform was used in order to enable the development of research activities in the teaching of chemistry. The acquisition of the experimental data was performed via Bluetooth through integration with the Smartphone (Figure 2) and via USB cable directly to the Microsoft Excel worksheet. The results were compared with the classical potentiometric titration, showing no statistically significant differences with the test applied at 95% confidence level. The purpose of the research teaching proposal was to experimentally determine the pKa value of captopril, that it is used with antihypertensive drug. This active learning methodology privileges work in collaborative groups and student participation in the construction of their knowledge. Further research on the possibilities of teacher training through the application of this instrument and other chemistry projects with Arduino in professional qualification courses at undergraduate and/or postgraduate level needs to be problematized. The complete description of this project is available in a dissertation published on the official page of PROFQUI UFV.



Figure 1: Automatic Titrator



Figure 2: Titration Curve Remotely for the Smartphone

References:

1. MACHADO JUNIOR, I. Desenvolvimento de Titulador Automático Baseado na Plataforma *Open Source* Arduino como Ferramenta Investigativa no Ensino de Química. Dissertação (Mestrado em Química em Rede Nacional), Universidade Federal de Viçosa, Viçosa, 2019.
2. <https://www.arduino.cc/>, accessed on Aug. de 2020.
3. <https://cursodearduino.net/>, accessed on Aug. de 2020.
4. https://youtu.be/mEkzs_sjXo4, accessed on Aug. de 2020.

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