Home Chemistry as a Tool for Understanding Environmental Chemistry

Environmental chemistry focuses on understanding the chemistry of natural water sources and water treatment, including concepts such as alkalinity, pH, and water hardness. It also includes atmospheric chemistry and organic chemistry related to the environment. Common experimental practices in environmental chemistry courses are conducted in laboratories following specific guidebooks. Many times students have to use chemicals and equipment they hardly have any access to outside the laboratory. Additionally, some schools, specially in developing countries, do not have enough equipment or chemicals for everyone in the classroom and students are obligated to work in large groups, where some students end up "watching" the practice instead of conducting it. The objective of this paper is to describe innovative environmental chemistry experimental practices that were developed in the University of los Andes, to increase student's ability to design and conduct experiments, encourage students to be creative and make decisions, and to work in teams, according to ABET Accreditation Criteria (2002-03) . These practices are conducted by students in their homes using "stuff" they can obtain at the supermarket. The guidebook for this course was designed such that students would have the main instructions on how to conduct the experiments but would be encouraged to find the proper conditions for the experiment to work properly and investigate other "stuff" they think could be interesting for understanding the topic. Practices include pH measurement, alkalinity curve development, water hardness test, and others. Acceptance by students has been good and practices have shown to give students a good understanding of the topic. Some practices are later conducted in the university's laboratory utilizing the necessary equipment and chemicals to give students the opportunity to see how those experiments are conducted professionally. Practices were started fall 2003 and are still being conducted as part of the environmental chemistry course.