Environmentally Benign Chemistry Including Microscale and Small Scale Laboratory

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Environmental protection is an important issue in chemical education. Papers included in this symposium are classified into three topics:

1. Environmentally Benign Laboratory: an Approach to Green Chemistry in Academia

Morning Session of Dec. 15 in Elima, Hyatt Regency

Environmentally Benign Chemistry in the Undergraduate laboratory
M. Gheorghiu, M. Gardner, J Steinfeld , Massachusetts Inst of Tech (MIT)

Microscale chemistry across the chemistry curriculum at all levels of chemical education: Its benefits and efficiency as a pedagogical tool.
M. Singh, *Natl Microscale Ctr, Department Of Chemistry, Merrimack College.

Microscale and green Chemistry; complementary pedagogies
Z. Szafran*, M. Singh, *New England College, Chemistry

Simple, easy and safe microscale and small scale experiments for high school chemistry
K. Ogino*, K. Shoji, *College of Medical Sciences, Tohoku University

The recent development o microscale chemistry in China
N. Zhou, Chinese Microscale Ctr, Hang Zhou Teachers College

90010039 Experimental quality and the small scale laboratory
S. Teratani, K. Habara, A. Ikuo, Tokyo Gakugei Univ

Comparing chemical cost and waste generation for microscale versus macroscale organic chemistry laboratory programs on a per student basis
R. Silberman, I. Maffetore, State U of New York/Cortland, Dept. Of Chemistry

Evening Poster Session in Hilton Hawaiian Village, Mid-Pacific – Coral, Ballroom III starting at 7:30 PM Sunday, Dec. 17

Comparison of small-scale experiments with ordinary-scale experiments.
K. Shoji*, K. Ogino, *Sendai Ikuei Gakuen High School

Microscale determination of potassium content in beverages by ion-selective electrode
A Yamasaki, Japanese Red Cross College of Nursing
Microscale experiment to isolate lipase producing bacteria and demonstrate their metabolic activity
D.C.Doria-Serrano, L.Pedraza-Segura Univ. Iberoamericana

2. Educational Perspectives of Green Chemistry
Afternoon Session of Dec. 15 in Elima, Hyatt Regency
Green chemistry - A new approach to pollution prevention
T Wlliamson, P. T. Anastas, M.M.Kirchhoff, US EPA, Office of Pollution Prevention and Toxics
Green chemistry; Aspects of benign synthesis
C. Raston, U. Kreher, D. Macfarlane. J. Scott, C. Straus, Monash Univ
Green & sustainable chemical activities in Japan
M. Kitajima, Japan Chemical Innovation Institute
Green chemistry; Alternative reaction media
J. Scott, Monash Univ., Centre for Green Chemistry
Greenness (green Index) of R&D toward sound development of green/sustainable chemistry
M. Misono, Kogakuin U, Department of Environmental Chemical Engineering
Activation of Hydrogen peroxide for rapid, selective, wood pulp bleaching: Green chemistry in action
J. Wright,* R.W.Allison, T. Collins, J.A. Hall C.P. Horwits I. D. Sucling L.D.Vuocolo, *Univ of Auckland

Morning Session of Dec. 16 in Elima, Hyatt Regency
Have you greened your chemistry curriculum?
M. Cann, U of Scranton, Chemistry Department University of Scranton
Clean technologies and recyclable solvents in research laboratories
T. Kitazume, Tokyo Institute of Technology
Green chemistry- trends and experiences from the activities to advance green chemistry sustainable chemistry
D.L. Schutt, R. J. Garant, B. B. Beardmore, B. B. Beardmore, American Chemical Society, Office of Legislative and Government Affairs
Green chemistry resources for the undergraduate curriculum: an ACS/EPA collaborative project
M. A Ryan, American Chemical Society, Higher Education

3.Understanding Environment through Chemistry
Morning Session of Dec. 16 in Elima, Hyatt Regency
Mode of neutralization function of humus(f layer) for acid precipitation
S. Yamaguchi, Tohoku Gakuin Univ

Evening Poster Session in Hilton Hawaiian Village, Mid-Pacific – Coral, Ballroom III starting at 7:30 PM Sunday, Dec. 17
Acid rain: Electrochemical effects in greenplants and soil
S. Kelly, A. Labady, J.Mwesigwa, Oakwood College
Preparation of low cost and reliable NO2 sampler and its application to simultaneous measurement of NO2 at 63 cities
F. Yasuhara,* S. Yamaguchi, Sendai National College of Technology