綠色/永續化學資訊共享 2012. 3. 1

Related News and Research breakthroughs:

(1) Three Green-Chemistry Workshops held in 243rd ACS national meeting, at San Diego, California, USA, March 25-29, 2012
(2) A New Green Chemistry Website
(3) A Periodic Table of Green Chemistry
(4) Metrics to evaluate "Greeness"
(5) A Green/Sustainable Survey
(6) Aqueous carbohydrates as sustainable media for catalyzed aldol reactions
(7) Ionic liquids to selectively dissolve lignin from lignocelluloses
(8) Tannins as Soft Template to prepare ordered mesoporous polymer and carbon materials
(9) Energy-efficient ionic liquid extraction of fuel and chemical feedstocks from algae
(10) Efficient aqueous hydration of various nitriles to amides
(11) Olefin metathesis using electrostatic immobilized pre-catalyst on Iron oxide magnetic particles
(12) Organic synthesis in water
(13) Green Bromine
(14) A New Printed Book about Green Chemistry
(15) Nanocatalysis and Prospects of Green Chemistry
(16) Conversion from a P-O bond into a P-N bond
(17) Undergraduate Green Chemistry Laboratory
(18) Cellulose as a reductant to reduce CuO into Cu in water
(19) Electrochemically Direct Phenol-Arene C, C Cross-Coupling in Water/MeOH
（20） 東海大學化學系梁碧峯教授(編著), "綠色化學概論"

資料蒐集:國立成功大學化學系 許拱北教授

(1) Three Green-Chemistry Workshops held in 243rd ACS national meeting at San Diego, California, USA, March 25-29, 2012: On March 26, Green Chemistry 101 –Introductory Workshop; Green Chemistry 201 –Advanced Workshop; On March 27, Green

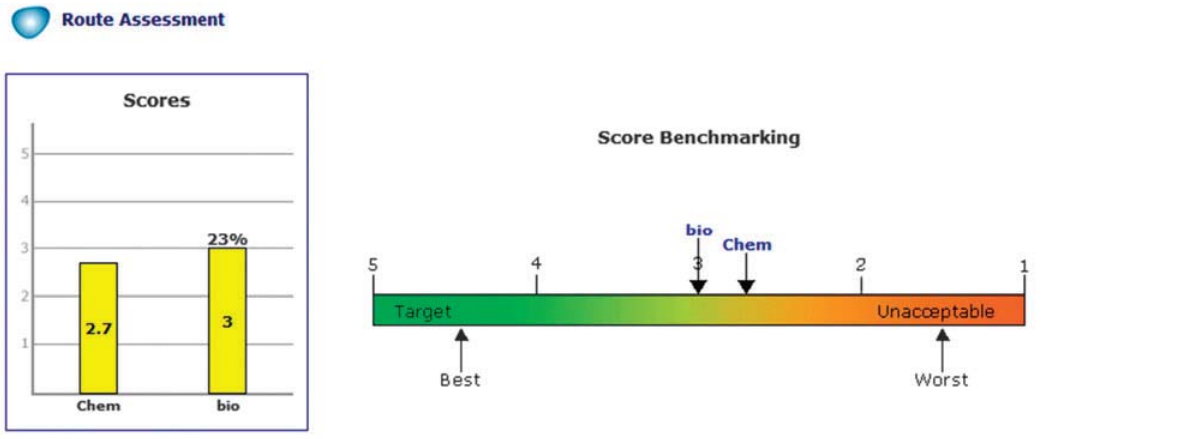
Chemistry 601 –Green Labs for Green Research.

(2) A New Green Chemistry Website: GreenChemWeb – A resource guide for green and sustainable chemistry (http://www.greenchem.org/).

(3) A Periodic Table of Green Chemistry with blue and green "elements" highlighting the ideas in the 12 Principles of Green Chemistry, PRODUCTIVELY, and 12 Principles of Green Engineering, IMPROVEMENTS, respectively.
Li, C.-J.; Anastas, P. T. *Chem. Soc. Rev.* **2012**, *41*, 1413-1414.

(4) Metrics to evaluate "Greeness": A number of different green metrics that can be used to assess a chemical process or system is presented.

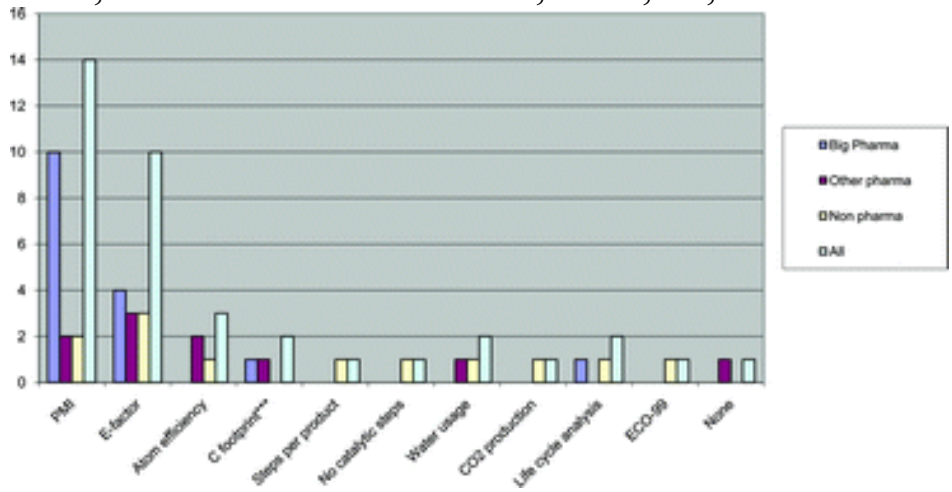
Jimenez-Gonzalez, C. et al., *Chem. Soc. Rev.* **2012**, *41*, 1485-1498.



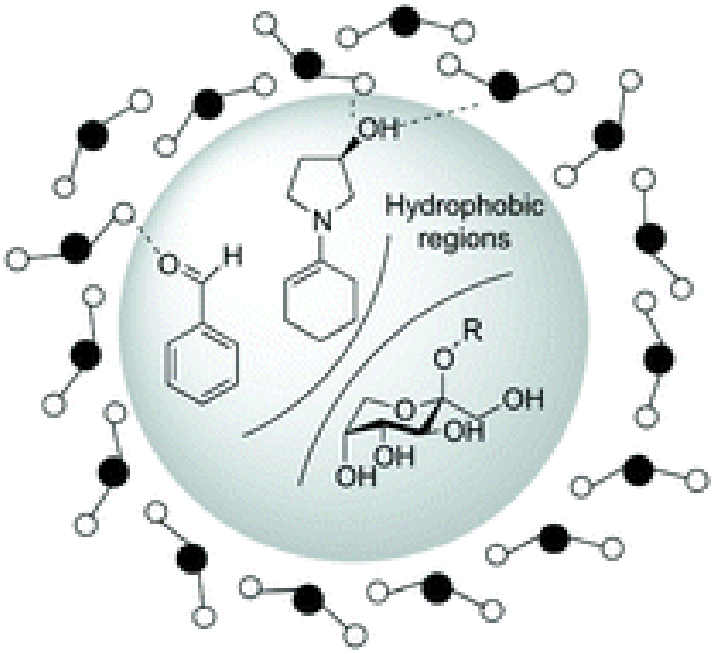
The % value shown is the improvement (reduction in environmental impacts) compared to the worst route selected.

Routes Evaluated (Graph Name)	MW	Comments
7-ACA chem July 07 (Chem)	272.27	chem route - Mass Bal Checked 16-7-07
7-ACA bio july2007 (bio)	272.27	Bio process - revised MB july 2007

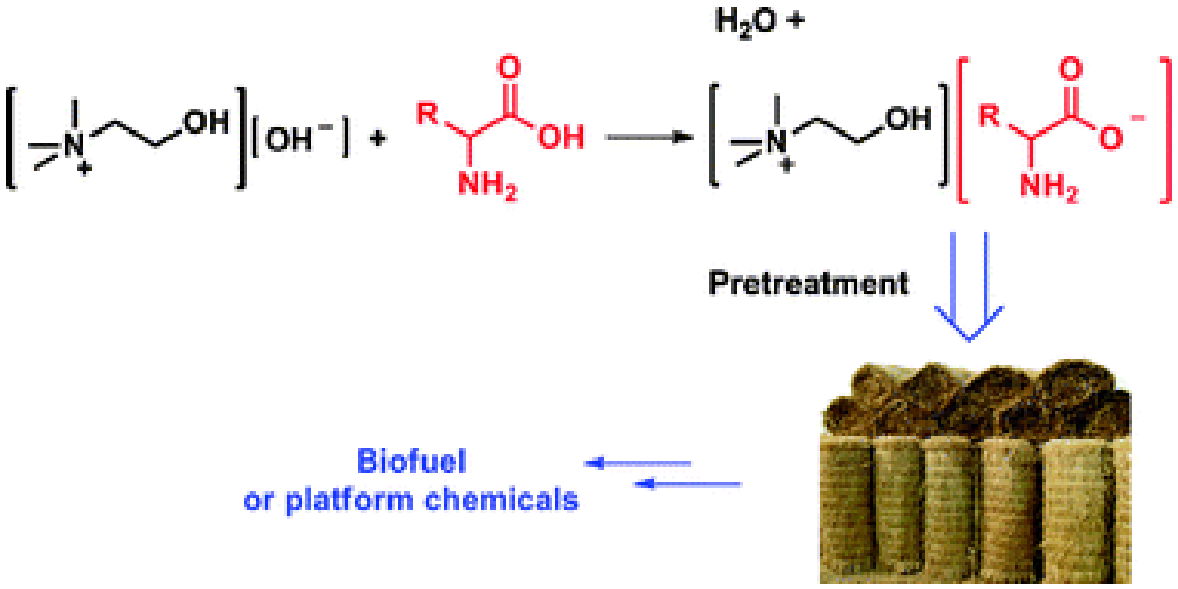
(5) A Green/Sustainale Survey: A total of 24 fine chemical, pharmaceutical, and related companies were approached and asked to complete a questionnaire, answering questions ranging from corporate green chemistry initiatives to specific green technologies. The questionnaire may be modified further and used for similar survey in Taiwan.
Watson, W. J. W. *Green Chem.*, **2012**, *14*, 251-259.



(6) Aqueous carbohydrates as sustainable media for catalyzed aldol reactions: Organocatalyzed direct aldol reactions were efficiently performed in aqueous solutions of facial amphiphilic carbohydrates with high diastereoselectivity and yields.
Bellomo, A. et al., *Green Chem*. **2012**, *14*, 281-284.

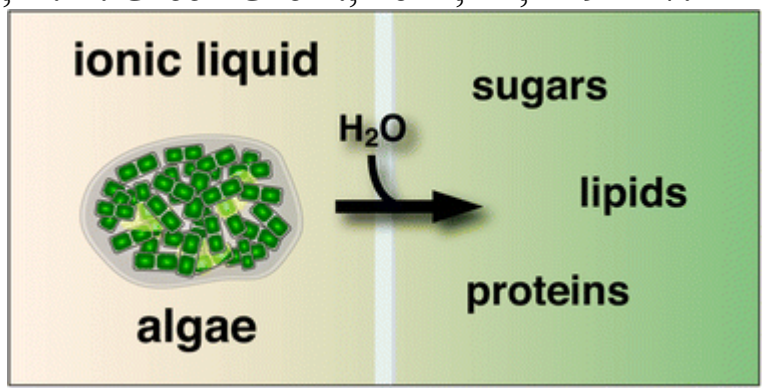


(7) Ionic liquids to selectively dissolve lignin from lignocelluloses: Cellulose and lignin are, respectively, the first and second most abundant renewable organic polymers on earth; and combined with hemicellulose, they constitute the structural components of plants. The 18 [cholinium][amino acids] ionic liquids, [Ch][AA]IL, prepared in this study have the capability of selectively dissolving lignin from lignocellulosic biomass. Microcrystalline cellulose and rice straw, after being pretreated using [Ch][Gly], the subsequent enzymatic hydrolysis efficiencies were significantly improved.
Liu, Q.-P. et al., *Green Chem.*, **2012**, *14*, 304-307.

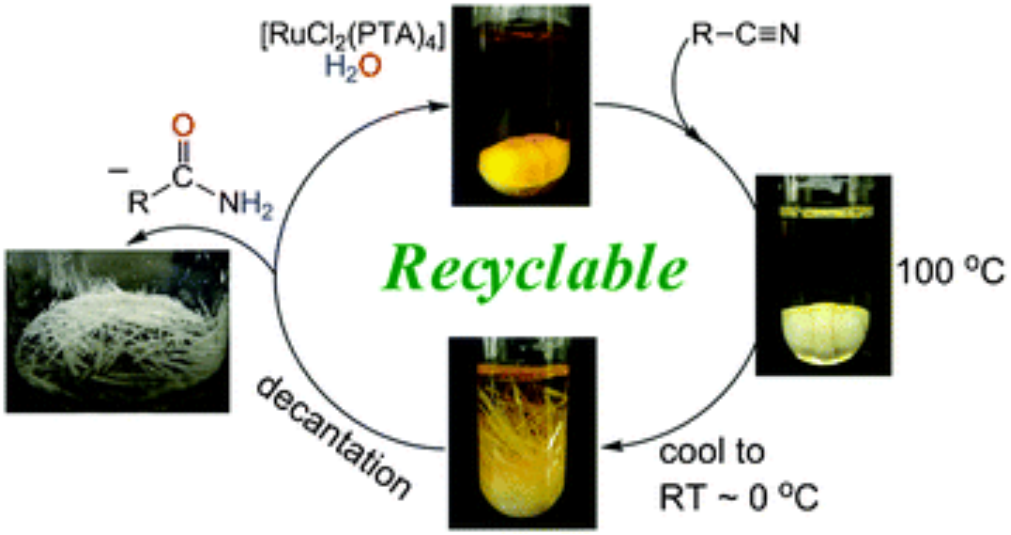


(8) Tannins as Soft Template to prepare mesoporous polymer and carbon materials: Condensed tannins were found to be a new, renewable and environment-friendly, class of precursor for the synthesis of ordered mesoporous polymer and carbon materials by a self-assembly approach.
Schlienger, S. et al., *Green Chem.*, **2012**, *14*, 313-316.

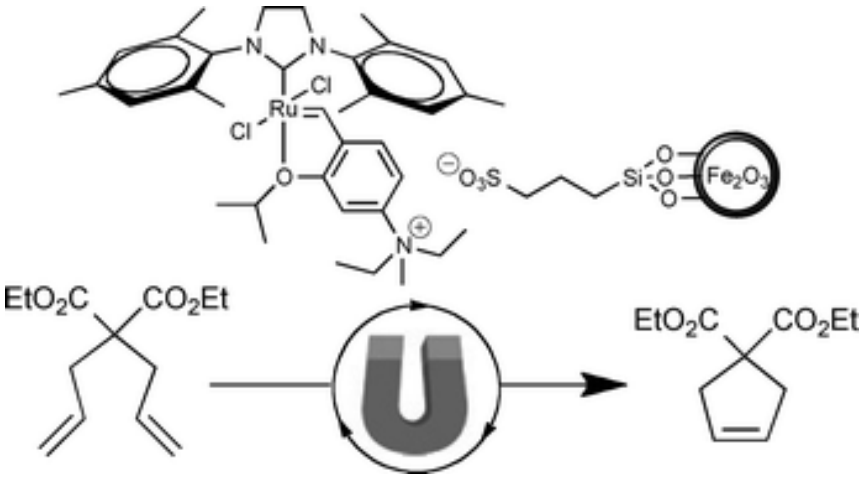
(9) Energy-efficient ionic liquid extraction of fuel and chemical feedstocks from algae: By dissolution and hydrolysis of wet algae biomass in ionic liquids without acids, bases or other catalysts, deconstruction of algae cell walls, resulting in release of cell contents, reached completion in <50 min regardless of algae species, at 100 to 140 ˚C and atmospheric pressure.
Teixeira, R. E. *Green Chem.*, **2012**, *14*, 419-427.



(10) Efficient aqueous hydration of various nitriles to amides was carried out in aqueous solution in the presence of air by the recyclable $[RuCl_2(PTA)_4]$ (PTA = 1,3,5-Triaza-7-phosphaadamantan). Isolation of the product amides can be performed by a simple decantation in many cases.
Lee, W.-C.; Frost, B. J. *Green Chem.*, **2012**, *14*, 62-66.

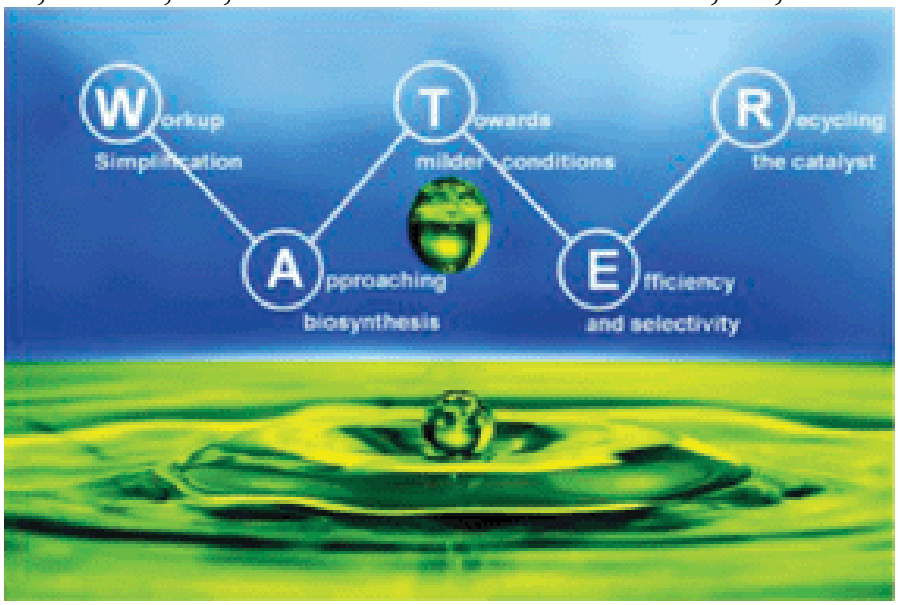


(11) Olefin metathesis using electrostatic immobilized pre-catalyst on iron oxide magnetic particles: A quaternary ammonium Hoveyda-Grubbs olefin metathesis pre-catalyst has been reversibly immobilized on sulphonic acid-functionalised silica-coated iron oxide magnetic particles to affect ring closing metathesis with easy removal, reuse and regeneration. Byrnes, M. J. et al., *Green Chem.*, **2012**, *14*, 81-84.

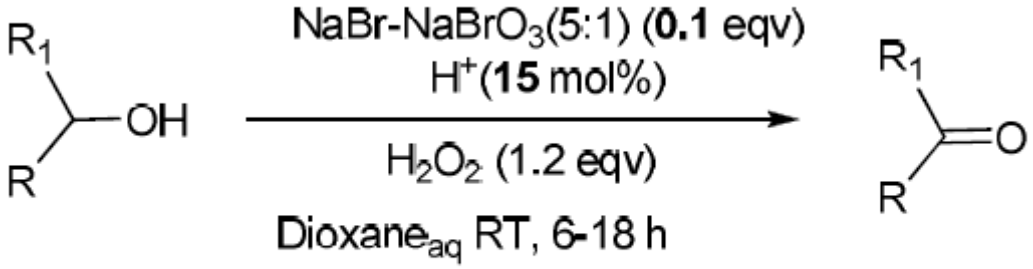


(12) Organic synthesis in water: The use of water as solvent features many benefits: not only because water itself is innocuous, but also it can potentially improve reactivities and selectivities, simplify the workup procedures, enable the recycling of the catalyst and allow mild reaction conditions and protecting group free synthesis. In addition, development of organic chemistry in water can lead to uncommon reactivities and reverse selectivities compared to organic solvents, thus complementing the organic chemists' synthetic toolbox.

Simon, M.-O.; Li, C.-J. *Chem. Soc. Rev.* **2012**, *41*, 1415-1427.



(13) Green Bromine: Selective oxidation of benzylic/secondary alcohols to the corresponding aldehydes/ketones with catalytic amount of bromide-bromate (10 mol%) couple and H_2O_2 as benign oxidant has been developed (Scheme 1).
Joshi, G. et al., RSC advances, DOI: 10.1039/c0xx00000x

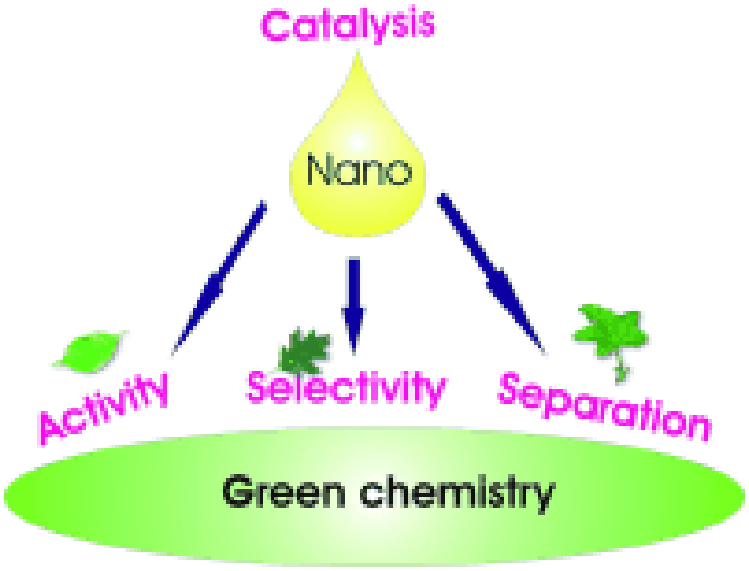


Scheme 1 Oxidation of alcohols

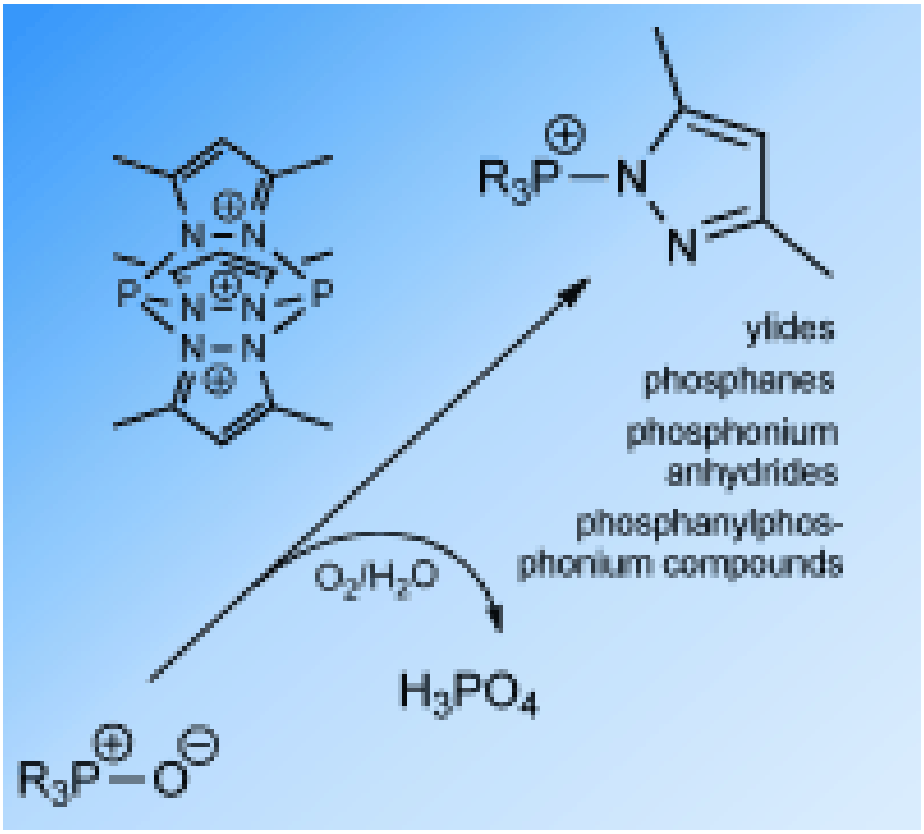
(14) A New Printed Book about Green Chemistry:
Sanghi, R.; Singh, V. (Ed.), Green Chemistry for Environmental Remediation, Wiley-Scrivener, December 27, 2011. ISBN-13: 978-0470943083

(15) Nanocatalysis and Prospects of Green Chemistry:
Collaboration of nanoscience with catalysis leads to the development of a new class of sustainable materials that fills the gap between homogeneous and heterogeneous catalysis. The nanocatalysts have been shown to have high activity, selectivity

and great ease of separation from the reaction medium.
Kalidindi, S. B.; Jagirdar, B. R. *ChemSusChem*, **2012**, *5*, 65-75.



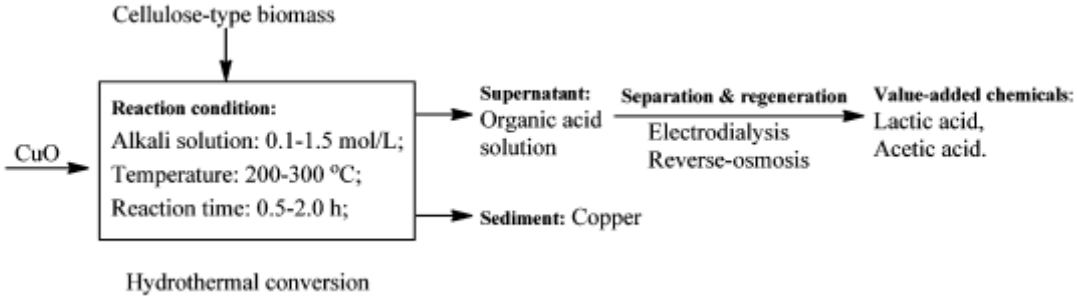
(16) Conversion from a P-O bond into a P-N bond: the smooth conversion of the resistant P-O bond in phosphane oxides into a reactive P-N bond of synthetically useful pyrazolylphosphonium salts is described. A highly charged, oxophilic, phosphorus-centered trication is employed and the reactions are conducted at room temperature with quantitative yields. The resulting pyrazolylphosphonium cations are valuable synthetic intermediates and are used for the synthesis of a variety of organophosphorus compounds.
Feldmann, K.-O. et al., *ChemSusChem*, **2011**, *4*, 1805-1812.



(17) Undergraduate Green Chemistry Laboratory: A one-term synthetic project that incorporates many of the principles of green chemistry is presented for the undergraduate organic laboratory.
Dintzner, M. R. et al., *J. Chem. Educ.*, **2012**, *89*, 262-264.

(18) Cellulose as a reductant to reduce CuO into Cu in water: a complete conversion of CuO into Cu was obtained at a temperature of 250 °C with a reaction time of 1.5 h in 0.50 mol/L NaOH. At the same time, cellulose was converted into value-added chemicals, such as lactic acid and acetic acid.
Li, Q. et al., *Ind. Eng. Chem. Res.* Articles ASAP. DOI:

10.1021/ie202151s.



(19) Electrochemically Direct Phenol-Arene C, C Cross-Coupling in Water/MeOH: a metal-free electrochemical method for cross-coupling between phenols and arenes using boron-doped diamond (BDD) anodes in fluorinated media was conducted for achieving non-symmetrical biaryls in superb selectivity and synthetic attractive yields.
Kirste, A. et al., *J. Am. Chem. Soc*. Just Accepted, DOI: 10.1021/ja211005g

(20) 東海大學化學系梁碧峯教授(編著), "綠色化學概論" (高立圖書有限公司出版),November, 2011.