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CONFÉRENCIER

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DATE

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TITRE

Greener Synthesis of Organics and Nanomaterials and Sustainable Applications of Nano-Catalysts

RÉSUMÉ

The presentation summarizes our recent activity in chemical synthesis involving benign alternatives, such as the use of supported reagents, and greener reaction medium in aqueous or solvent-free conditions.¹ The synthesis of heterocyclic compounds, coupling reactions, and a variety of name reactions² are the primary beneficiaries as exemplified by the synthesis of N-aryl azacycloalkanes, isoindoles, and dihydropyrazoles, 1,3,4-oxadiazoles, 1,3,4-thiadiazoles, 1,3-dioxanes, pyrazoles, catalyzed by basic water or polystyrene sulfonic acid (PSSA) in aqueous media in conjunction with microwave (MW) irradiation.²

Vitamins B1, B2, C, and tea and wine polyphenols which function both as reducing and capping agents, provide extremely simple, one-pot, green synthetic methods to bulk quantities of nanomaterials in water.^{3a} Shape-controlled synthesis of noble nanostructures via MW-assisted spontaneous reduction of noble metal salts using sugars will be presented.^{3b} A general method has been developed for the cross-linking reaction of poly (vinyl alcohol) (PVA) with metallic systems; bimetallic systems,^{3c} and SWNT, MWNT, and C-60.^{3d} The strategy is extended to the formation of biodegradable carboxymethyl cellulose (CMC) composite films with noble nanometals;^{3e} such metal decoration and alignment of carbon nanotubes in CMC is possible using MW approach^{3f} which also enables the shape-controlled bulk synthesis of Ag and Fe nanorods in poly (ethylene glycol).^{3g} MW hydrothermal process delivers magnetic nanoferrites⁴ and micro-pine structured catalysts are obtainable in water from readily available metal salts.⁵ Sustainable route to nano particles using polyphenols from waste,⁶ their applications in catalysis,^{7,8} toxicity⁹ and environmental remediation¹⁰ will be highlighted.

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- [2] V. Polshettiwar, R.S. Varma, *Tetrahedron Lett.*, **49**, 879 (2008); *ibid.*, *Tetrahedron Lett.*, **49**, 397 (2008); *ibid.*, *J. Org. Chem.*, **72**, 7420 (2007); *ibid.*, *Tetrahedron Lett.*, **48**, 5649 (2007); *ibid.*, *Tetrahedron Lett.*, **48**, 7343 (2007); Y. Ju, R.S. Varma, *J. Org. Chem.*, **71**, 135 (2006).
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- [10] G.E. Hoag, J.B. Collins, J.L. Holcomb, J.R. Hoag, M.N. Nadagouda, R.S. Varma: *J. Mater. Chem.*, **19**, 8671 (2009).

La conférence aura lieu à **14h** au local **VCH-2860** du Pav. A.-Vachon
Un café sera servi avant la conférence. Cordiale invitation à toutes et à tous !

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