who have the necessary expertise in the field. The key role of process mineralogy is recognised in the publication and demonstrated in a paper on the mineralogy and behaviour of the platinum group metals during processing of the Noril'sk ores by M. Z. Komarova and colleagues.

The text runs to 844 pages and, surprisingly, it has no subject index. Furthermore none of the papers has an abstract which means that retrieval of information is not going to be easy for the casual reader. However, the CIM offers a CD-ROM containing the papers in PDF format and this allows a word search in the usual way. However, this is no substitute for a professionally compiled index. While clearly it must have been a formidable task securing all the contributions, arranging reviews and coordinating final versions, the editor would have produced a more useful volume if he had been more proactive in the final production stage. It would, for example, have been helpful if in the Preface Cabri had explained how his own contribution on the platinum group minerals related to the role of process mineralogy where this was described in papers on beneficiation.

Nevertheless for geologists, chemists and mineral process engineers seeking a convenient format for obtaining background information on PGE projects the effort of working through the primary material would be well worthwhile.

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Resin-Supported Palladium Complexes for Catalyses in Water

One of the aims of green chemistry is to switch from organic solvents to water for organic transformations, to reduce environmental problems and contribute to safety. Palladium (Pd)-phosphine complexes are highly active and widely used in organic catalyses, with organic solvents, although Suzuki chemistry can be performed in water/EtOH systems. Water-soluble phosphine catalysts are available, but as many substrates are insoluble in water, they have been received less attention. However, if Pd-phosphine complexes, combined with a solid support, could undertake catalyses in water, it would be a powerful tool in organic synthesis.

Now, Y. Uozumi from the Institute for Molecular Science, Okazaki, Japan, reports the preparation of Pd-phosphine complexes bound to an amphiphilic polymer resin, and their success as catalysts for various reactions in aqueous media (*J. Synth. Org. Chem., Jpn.*, 2002, **60**, (11), 1063–1068).

Polystyrene-poly(ethylene glycol) (PS-PEG) is a commonly used resin, functionalised for attachments. PS-PEG resin beads show relatively uniform swelling in solvents of different polarities. A PS-PEG resin with an amino group was chosen as a support for phosphines. The resin-supported phosphines were then treated with excess $[PdCl(\eta^3\text{-}C_3H_5)]_2$ (Pd:P = 1.2:1) to form a Pd monophosphine complex.

The Pd-phosphine-PS-PEG resin was successfully tested for various transformations in water, such as allylic substitution, hydroxycarbonylation of aryl halides, the Heck reaction, cross-couplings of aryl halides and allyl acetates with arylboron reagents, asymmetric allylic substitution, etc. The catalyst could be recovered and reused without significant loss of activity and selectivity. A novel chiral *P,N*-ligand was prepared on PS-PEG, and with Pd, in water, gave π-allylic substitutions of cyclic and acyclic substrates of enantioselectivity up to 99% ee.

Red-Light Emission Using Iridium

A team from the National Tsing-Hua University, Taiwan, report a new route to design electroluminescent polymers (X. Chen, J.-L. Liao, Y. Liang, M. O. Ahmed, H.-E. Tseng and S.-A. Chen, *J. Am. Chem. Soc.*, 2003, **125**, (3), 636–637). They grafted high-efficiency green $Ir(ppy)_3$ and red $btp_2Ir(acac)$ phosphorescent complexes as dopants and carbazole (Cz) charge transport moieties onto alkyl side chains of fully conjugated polyfluorene polymers, for polymer light-emitting diodes (PLEDs).

The fabricated PLEDs emitted red light with high efficiency, 2.8 cd A^{-1} at 7 V and 65 cd m^{-2}, and can emit broad band light having blue, green and red peaks (2.16 cd A^{-1} at 9 V). Incorporating Cz significantly increases the efficiency and lowers the turn-on voltage.