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## Heterogeneous Suzuki cross-coupling reaction in water catalyzed by palladium nanoparticles supported on individual calcium carbonate plates derived from mussel shell particle.

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A new palladium nanoparticles catalyst supported on individual calcium carbonate plates (Pd/ICCP) is prepared from Asian green mussel shells and used as heterogeneous catalyst in Suzuki cross coupling reaction. The reduction of palladium (II) generates palladium (0) nanoparticles which can embed on individual calcium carbonate plates (ICCP) to give Pd/ICCP. The prepared Pd/ICCP catalyst is characterized by scanning electron microscopy (SEM) and energy-dispersive X-ray spectroscopy (EDX), indicating an entire dispersion of palladium onto the surface of individual calcium carbonate plates. Furthermore, palladium content in the prepared Pd/ICCP catalyst is determined by inductively coupled plasma optical emission spectroscopy (ICP-OES). The optimized study is investigated in Suzuki cross-coupling reaction between 4-iodoanisole and phenylboronic acid. It reveals that using potassium carbonate in mixed solvent of EtOH: H<sub>2</sub>O (3:2) in the presence of 2 mol% of Pd/ICCP give 4-methoxybiphenyl in 90% isolated yield at 40 °C. Moreover, in the presence of cetyltrimethylammonium bromide (CTAB) as phase transfer agent, the reaction can preform in water as a sole solvent to give the product in excellent yield under the same condition.

**Primary author:** Ms CHOTNITIKORNKUN, Sukumaporn (Department of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand.)

**Co-author:** Prof. SUKWATTANASINITT, Mongkol (Nanotec-CU Center of Excellence on Food and Agriculture, Department of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand.)

**Presenter:** Ms CHOTNITIKORNKUN, Sukumaporn (Department of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand.)

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