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## Micelles catalyzed chemo and regio-selective synthesis of substituted quinones in $H_2O$ as potent antimicrobial and anticancer agents

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The extensive use of water as a medium for organic synthesis has been due to concept and language of *Sharpless et al.,* where reactions were carried out in aqueous solutions for cases where reactants are insoluble in water. The surfactant-type catalysts play a dual role both as a catalyst to activate the substrate molecules and as a surfactant to increase the concentration of organic reactants to form micelle particles in water. In connection with our studies on the reactivity of 1,4-benzo and naphthoquinones with carbon, nitrogen and sulfur nucleophiles in aqueous medium and the utility of surfactants in aqueous medium, we have carried out reactions of 1,4-benzo and naphthoquinones and its derivatives with carbon, nitrogen and sulfur nucleophiles by economical green methodology approach using surfactant as a catalyst. The green methodology approach employing micelles as green catalysts has led to synthesis of 1,4- benzo and naphthoquinones derivatives which have been evaluated for their antimicrobial and anticancer activity. The detailed synthesis and biological activity of potent drug candidates will be discussed.

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## Synergistic effect of phosphoric acid and Ru/AC in the aqueous catalytic conversion of biomass-derived polyol into gasoline alkanes

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Aqueous phase hydrodeoxygenation as a catalytic process to remove the total or partial oxygenates from water-soluble biomass-derived oxygenates, plays critical roles in the high-energy-density hydrocarbons productions. Here, Ru/AC catalyst was selected to conversion acidic biomass-derived polyol solution (co-fed with phosphoric acid) into gasoline alkanes in fixed-bed reactor as its high catalytic activity and good resistance property in acid environment. Interestingly, the catalytic system showed completed polyol conversion and high C5/C6 (pentane and hexane) selectivity (83%). To identify the active chemical states of reaction Ru/C catalyst for this reaction, a series of pre- and post characterization studies have been performed. $N^2$ adsorption-desorption isotherm and FTIR results showed that the physisorption and chemisorption of polyol molecule and ionized phosphorus groups on Ru/AC catalyst. The phosphoric acid on catalysts would weaken the metallic property of Ru and produced RuOx/Ru complex. XPS and HRTEM spectrums were further confirmed the synergistic effect of phosphoric acid and Ru/AC.

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