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Synthesis, Structure and Redox Properties of Sterically Protected Phosphaquinoid Compounds

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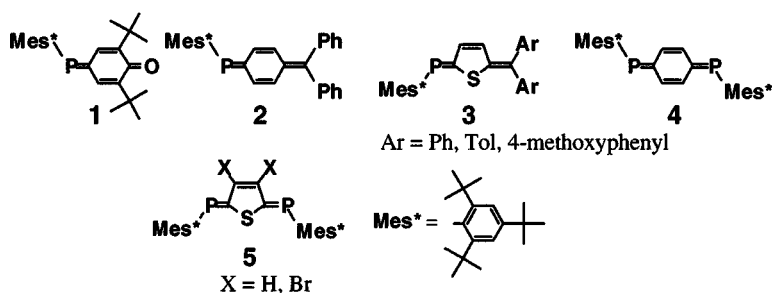
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SYNTHESIS, STRUCTURE AND REDOX PROPERTIES OF STERICALLY PROTECTED PHOSPHAQUINOID COMPOUNDS

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Synthesis, structure, and redox properties of the sterically protected phosphaquinone **1**, phosphaquinomethane **2**, phosphathienoquinomethanes **3**, diphosphaquinone **4**, and diphosphathienoquinones **5** were investigated. The phosphaquinoid skeletons were generally synthesized by 1,6-elimination of the benzenoid precursors and isolated as stable compounds. Structures of the novel phosphaquinoid compounds, which were studied by ^1H , ^{13}C , ^{31}P NMR, IR, and UV-Vis spectroscopy and X-ray crystallography, were consistent with the quinoid structure. Redox properties of the phosphaquinoid compounds were studied by cyclic voltammetry. Two or more step reductions were observed and the corresponding anion radicals were generated by alkaline metal reduction and characterized by EPR. Structures of the phosphasemiquinone anion radicals were clarified based on isotropic as well as anisotropic ^{31}P hyperfine couplings.



SCHEME 1

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