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Title:

Selective synthesis of pyrazolo[3,4-*d*]pyrimidine, *N*-(1*H*-pyrazol-5-yl)formamide, or *N*-(1*H*-pyrazol-5-yl)formamidine derivatives from *N*-1-substituted-5-aminopyrazoles with new vilsmeier–type reagents

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Various halomethyleniminium salts were synthesized by using formamide or *N*-methylformamide in the presence of phosphorous oxychloride $POCl_3$. These novel Vilsmeier agents were treated with a series of *N*-1-substituted-aminopyrazoles, including *N*-1-phenyl-5-aminopyrazoles, *N*-1-(2-pyridinyl)-5-aminopyrazoles, and *N*-1-(2-quinolinyl)-5-aminopyrazoles, to give the various resulting products such as pyrazolo[3,4-*d*]pyrimidine, *N*-(1*H*-pyrazol-5-yl)formamide, or *N*-(1*H*-pyrazol-5-yl)formamidine derivations. Our experimental result was different with the traditional Vilsmeier–type reaction and the plausible reactive pathways were proposed to describe the unexpected result.