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Synthesis of (2H)-indazoles through Rh(III)-catalyzed annulation reaction of azobenzenes

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Azobenzene derivatives have been used for surface-modified materials, polymers, protein probes, and chemosensors. Therefore, the development of various synthetic transformations of azobenzenes has been recognized as one of the important tasks in organic chemistry. With advances in catalytic C–H functionalization, great effort has been devoted to the construction of various azobenzene derivatives. Particularly, the formation of N-heterocycles has been intensively disclosed through sp2 C–H functionalization of azobenzenes followed by intramolecular C–N bond formation. As a fascinating motif widely found in numerous bioactive compounds, 3-acylindazoles have recently shown their great potential in pharmaceuticals with a broad spectrum of medicinal applications. Remarkably, a broad range of pharmacological profiles such as anti-inflammatory, viral polymerase inhibition, antiemetic, and anticancer activities has been reported Sulphur ylides have been known as versatile precursors to deliver metal–carbene complexes. In continuation of our recent studies on the Rh(III)-catalysed synthesis of various heterocycles via C–H functionalization, we herein present the rhodium(III)-catalysed C–H alkylation followed by intramolecular cyclization between azobenzenes and sulfoxonium ylides affording 3-acyl (2H)-indazoles. Additionally, the formation of (1H)-indazoles through the base-mediated annulations reaction of alkylated intermediates was demonstrated to prove the cyclization mode of this process.

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