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N-Acyl-glutarimides: effect of glutarimide ring on the structures of fully perpendicular twisted amides and N–C bond cross-coupling.

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Streszczenie

N-Acyl-glutarimides have emerged as the most reactive precursors for N–C(O) bond cross-coupling reactions to date, wherein the reactivity is driven by ground-state destabilization of the amide bond. Herein, we report a full study on the effect of a glutarimide ring on the structures, electronic properties, and reactivity of fully perpendicular *N*-acyl-glutarimide amides. Most notably, this report demonstrates the generality of deploying *N*-acyl-glutarimides to achieve full twist of the acyclic amide bond, and results in the discovery of *N*-acyl-glutarimide amide with an almost perfect twist value, τ = 89.1°. X-ray structures of five new *N*-acyl-glutarimides are reported. Reactivity studies in the Suzuki–Miyaura cross-coupling and transamidation reactions provide insight into the reactivity of *N*-acyl-glutarimides in metal-catalyzed and transition-metal-free reactions. The effect of distortion, structures, and rotational barriers around the N–C(O) axis is discussed. The ability to achieve full distortion of the amide bond significantly expands the range of reagents available for N–C(O) cross-coupling reactions.

Słowa kluczowe

Chemical structure, Amides, Organic compounds, Reactivity, Cross coupling reaction

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