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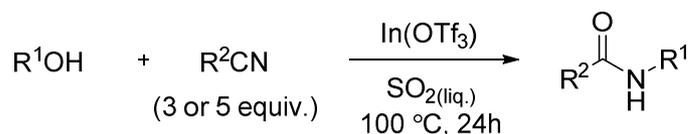
Indium triflate catalyzed Ritter reaction in liquid sulfur dioxide

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The Ritter reaction is one-pot process for amide bond formation from nitrile and carbenium ion generating group (usually alcohol or alkene) in a strongly ionizing medium. Because of its atom efficiency and easy application, Ritter reaction has proved to be useful in synthesis of various biologically active molecules and drugs [1]. Important drawbacks of the classical Ritter reaction involves use of at least stoichiometric amounts of a corrosive Brønsted acid thus often limiting its applicability to compounds containing acid labile functional groups.

Sulfur dioxide is not only useful building block in synthetic organic chemistry but in its liquid state can be used as a strong polar solvent as well [2]. In the Ritter reaction conditions $\text{SO}_{2(\text{liq.})}$ can facilitate formation of carbenium ion [3]. With benzyl alcohol as a model species various Lewis and Brønsted acids were tested for their ability to promote amide formation in $\text{SO}_{2(\text{liq.})}$. $\text{In}(\text{OTf})_3$ proved to be the best catalyst in terms of conversion. New reaction conditions were used for different secondary and tertiary alcohols with good to excellent yields (Scheme 1).



Scheme 1. The Ritter reaction in liquid sulfur dioxide

Relatively low catalyst loading and activation of secondary alcohols toward reaction are proof of efficiency of $\text{SO}_{2(\text{liq.})}$ as a medium for the Ritter reaction.

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