

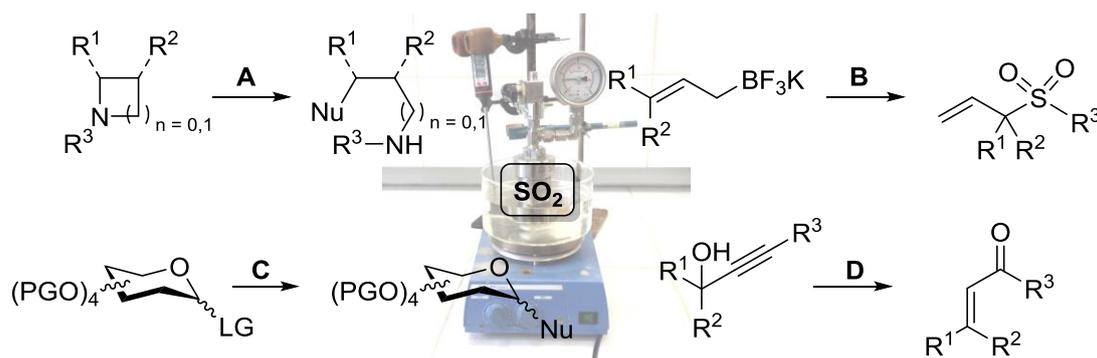
Application of liquid sulfur dioxide as a solvent for organic transformations

J. Lugiņina, Riga/LV, K. Suta, Riga/LV, M. Turks,* Riga/LV

Mg. sc. ing. Jevgeņija Lugiņina, Riga Technical University,
P. Valdena Str. 3, Riga, LV-1048, Latvia

In recent years, many applications of SO₂ and its surrogates in organic synthesis have been reported [1]. Due to high polarity and Lewis acid properties sulfur dioxide can be used as strongly ionizing solvent. Furthermore, it has a high dipole moment (1.61 D), therefore it readily can dissolve both organic and inorganic compounds. On the other hand, SO₂ has been reported as a reaction medium for processes involving carbenium ions. This has prompted us to search for organic reactions that would profit from their running in liquid SO₂ as a reaction medium.

We have discovered that different aziridines and azetidines undergo efficient ring-opening reactions in liquid SO₂ with metal halides and thiols as nucleophile sources (transformation **A**) [2,3].



A novel method for the synthesis of sulfones also has been elaborated. Major step for further sulfone generation is bora-ene reaction of sulfur dioxide and substituted potassium trifluoroborate giving mixed sulfinic/boric anhydrides (transformation **B**).

We investigated glycosylation reaction with a wide range of O-, and S-nucleophiles of different monosaccharides in liquid SO₂ (transformation **C**).

We have also found that liquid SO₂ facilitates Meyer–Schuster and Rupe rearrangement reactions (transformation **D**).

Literature:

[1] J. Lugiņina, *Synlett*, 2014, 25, 2962.

[2] J. Lugiņina, J. Uzuleņa, D. Posevins, M. Turks, *Eur. J. Org. Chem.* 2016, 1760.

[3] J. Lugiņina, M. Turks, *Synlett*, 2017 in press (DOI: 10.1055/s-0036-1588670).