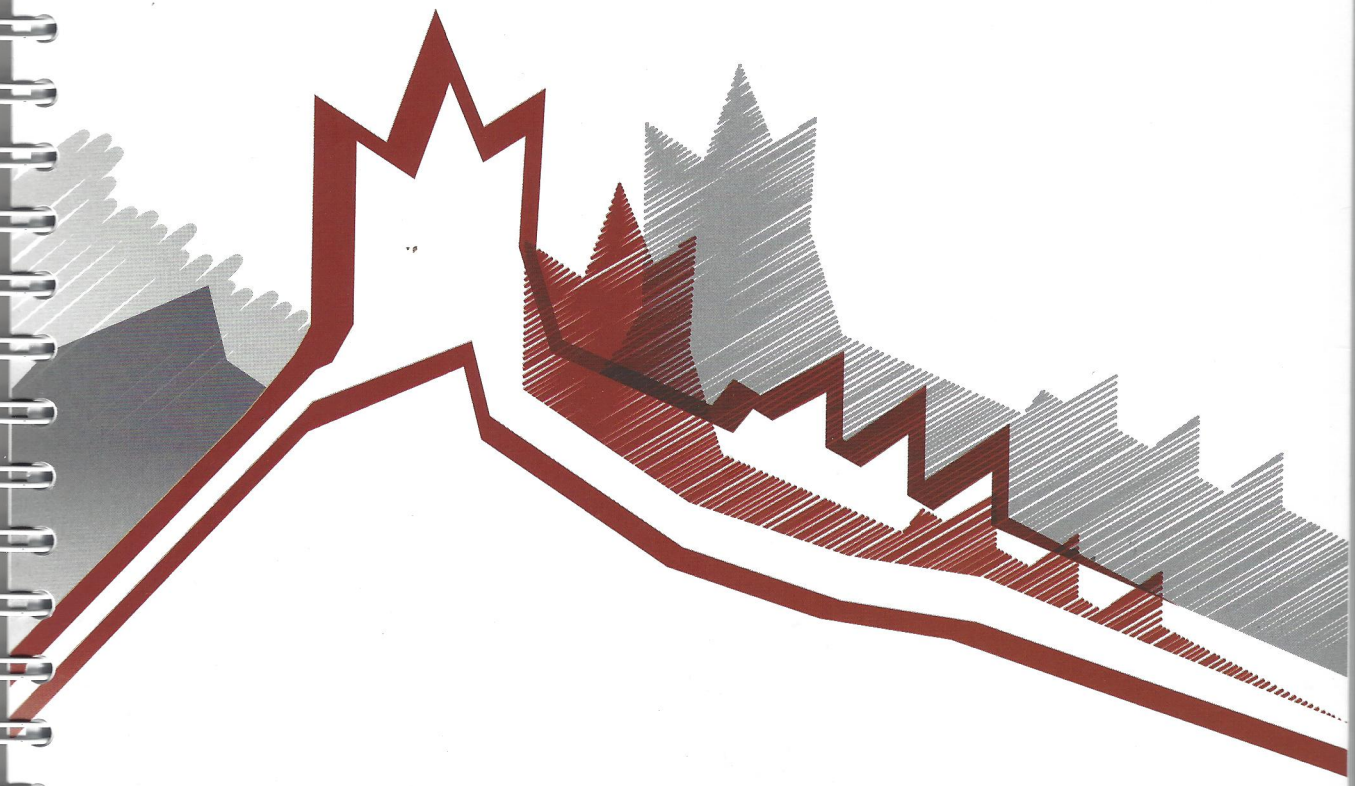

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PROGRAM AND ABSTRACTS

NUCLEOPHILIC RING OPENING OF PROTECTED AND UNPROTECTED SMALL N-HETEROCYCLES IN LIQUID SO_2

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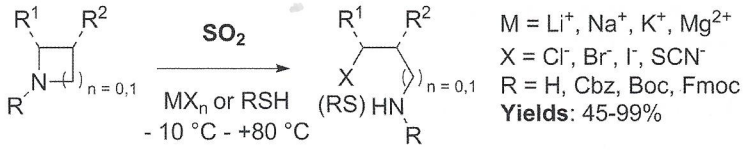
In the field of organic chemistry SO_2 is used as a solvent, catalyst and a reagent.[1] It has a broad liquid range (from –75°C to –10°C) and due to the high dipole moment (1.6 D) it has high solvation power for ionic and covalent compounds. By dissolving inorganic and organic substances in liquid SO_2 it is possible to perform S_N2 type reactions, including nucleophilic ring opening of small *N*-heterocycles under mild reactions conditions described by us.[2]



Here we present a new synthetic process of nucleophilic ring opening reactions (NRORs) of different protected and unprotected aziridines and azetidines with I and II group metal halides and *S*-nucleophiles in liquid sulfur dioxide. The reactions were carried out in three temperature modes and the efficiency of each *N*-heterocycle ring opening reaction was monitored in several solvents in parallel experiments: SO_2(liq.), DMSO, MeCN, TFE and acetone. Results showed that that NRORs of *N*-heterocycles in liquid SO_2 proceeds noticeably faster and cleaner than in classical solvents. For example, reaction of Cbz-protected aziridine and NaCl takes only 12 h at room temperature in liquid SO_2 to form expected halo-carbamate in almost quantitative yield while similar reaction in classical solvents did not proceed at all.

References

1. a) Lugiņina, J. *Synlett* **2014**, 25, 2962. B) Deeming, A. S.; Emmett, E. J.; Richards-Taylor, C. S.; Willis, M. C. *Synthesis* **2014**, *46*, 2701.
2. Lugiņina, J.; Uzuleņa, J.; Posevins, D.; Turks, M. Eur. *J. Org. Chem.* **2016**, 1760.