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Investigation of catalytic activity of oxovanadium(IV) unsymmetrical salen complex in the oxidative coupling of thiols to disulfides with UHP

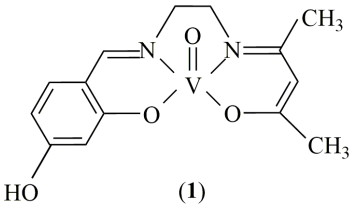
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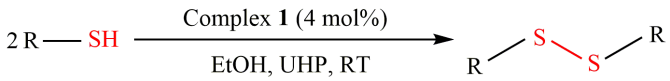
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A main reaction in biological and chemical processes is the conversion of thiols to disulfides [1]. The disulfide bond formation in active biochemical molecules, peptides, and sweet oil processing is essential. Besides, disulfides, as a highly beneficial class of compounds, are applied in various industrial and biological processes such as peptide stabilization in proteins, DNA cleavage, vulcanizing agents for elastomers and rubbers, and designing rechargeable lithium batteries [2].

In the present work, the oxovanadium(IV) unsymmetrical salen complex (**1**) was synthesized in good yield based on the the literature [3]. The synthesized complex **1** was successfully applied as a new homogeneous catalyst for oxidative coupling of thiols to disulfides with urea/H_2O_2 (UHP) as oxidant in ethanol as solvent at room temperature (Scheme1). Good yields of products, mild reaction conditions and no formation of by-products can be mentioned as advantages of this method for the preparation of disulfides.



(**1**)



Scheme 1: Oxidative coupling of thiols to disulfides catalyzed by complex **1**

Keywords: Oxo-vanadium(IV) Schiff base complex, Homogeneous catalyst, Selective oxidation, Sulfide

References

[1] R. Ozen, and F. Aydin, *Monatshefte für Chemie*, **2006,** 137, 307.

[2] T. Tamoradi, M. Ghadermarzi, A. Chorbani-Choghamarani, and S. Molaei, *Research on Chemical Intermediates*, **2018,** 44, 4259.

[3] A. Mahdian, M. Hatefi Ardakani, E. Heydari-Bafrooei, and S. Saeednia, *Applied Organometallic Chememistry,* **2021,** 35, e6170.