

Products of high-pressure disulphide metathesis controlled by mass spectrometry

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Mass spectrometry is an essential analytical technique and it has gained great popularity due to such features as unequalled sensitivity, speed and variety of other applications. This fast method is commonly used in drug discovery, in pollution and food control or in forensic science.[1]

In our experiments we have used mass spectrometry to identify the products of high-pressure methathesis reactions. We carried out several pressure-induced disulfide metathesis reactions in the diamond-anvil cell. (Figure 1). This reaction is a first example of a reaction in which the high-pressure is used instead of catalytic or reducing agent.[2] At ambient conditions this reaction can be conducted with high efficiency either by ball mill grinding or by liquid assisted grinding, however in both this processes the additional catalysts is required.[3]

In our studies, we have investigated metathesis reactions between *p*-tolyl disulfide, 4-chlorophenyl disulfide, 2-aminophenyl disulfide and 2-nitrophenyl disulfide. To confirm that the reaction occurred and expected products were obtained, the mass spectrometry was used. By using this quick method, we can immediately improve the yield of reaction and what is more important ,their selectivity by changing concentration, pressure or used solvent. What is more, choosing the right conditions is extremely important for

obtaining the high-quality single crystals, which can be further characterized by single-crystal X-ray diffraction measurements.

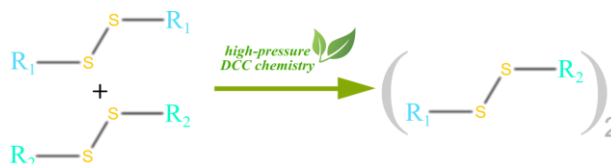


Figure 1. Reaction scheme for disulfide metathesis.

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