

Study of photo-degradation of new 2-oxazoline telluride derivative.

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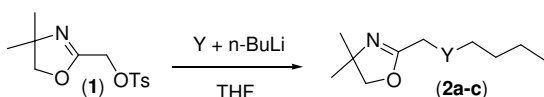
INTRODUCTION

The photooxidation products of di-benzyl-tellurides and arylalkyl tellurides were described by Cava^[1] and Clive². Ferreira³ studied the photodegradation process for arylbenzyltellurides. All this results indicates that the processes must be mediated by one or more radicalar steps^[2]. On the other hand radical tellurides derivatives have considerable potential for use in organic synthesis^[4, 5].

In this work, is shown the first results of the synthesis of a 2-oxazoline telluride derivative and its photo-degradation behavior.

RESULTS AND DISCUSSION

2-oxazolinyl-butyl-chalcogen (**2a-c**) were easily prepared by substitution of tosylate (**1**) with appropriated lithium n-butyl-chalcogenolate salt in THF (Scheme 1).



Y = S (**2a**) 80% , Se (**2b**) 78% or Te (**2c**) yield not determined

Figure 1. Synthesis of (**2a-c**).

However, during the purification process of (**2c**) was observed a precipitation of a white solid, as soon as the product leaves the chromatography column. After 30 minutes all purified product was consumed as determined by TLC analysis.

To investigate this process, (**2c**) was synthesized under white light protection and using deoxygenate helium atmosphere, even through the purification process and characterized by NMR spectrometry and HRMS spectroscopy.

After characterization, compound (**2c**) was submitted to the photo-degradation conditions using ultra-violet light and an oxygen flow through the solution of CDCl₃ or THF. This step was made inside a NMR tube and the tellurium fading was monitored using ¹²⁵Te NMR experiments as shown in Figure 1.

The telluride (**2c**) signal at 387 ppm totally disappeared after 40 minutes of degradation using UV/O₂ conditions (Spectrum C).

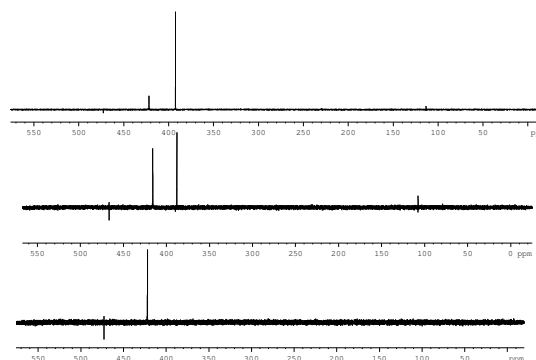
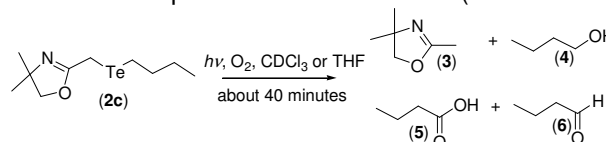


Figure 1. ¹²⁵Te NMR of degradation of (**2c**).

The resulting solution was analyzed by GC-FID and 4 out of 7 products were identified (Scheme 2).



Scheme 2. Photo-degradation of (**2c**) and the major products.

CONCLUSION

In this work, we described the first study of photo-degradation of alkylloxazolinyl tellurides and the preliminary results of this transformation.

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[1] LEE, H., CAVA, M. P., *Journal of the Chemical Society, Chemical Communications*, **1981**, 277-278.

[2] CRICH, D., CHEN, C., HWANG, J. T., YUAN, H. W., PAPADATOS, A., WALTER, R. I., *Journal of the American Chemical Society*, **1994**, 116, p.8937-8951.

J.T.B., Oliveira, A.R.M., Comasseto, J.V., *Tetrahedron Lett.*, **1992**, 33, 915

[3] OBA, M., ENDO, M., NISHIYAMA, K., OUCHI, A., ANDO, W., *Chemical Communications* **2004**, 1672-1673.

[4] OUCHI, A., HYUGANO, T., LIU, C., *Organic Letters*, **2009**, 11, 4870-4873.

[5] MEYERS, A. I. *The Journal of Organic Chemistry*, **2005**, 70, 6137-6151.