

# 1,2-グリコール環状シュウ酸ジエステルの合成と開裂

メタデータ	言語: Japanese 出版者: 公開日: 2022-06-17 キーワード (Ja): キーワード (En): 作成者: メールアドレス: 所属:
URL	<a href="https://doi.org/10.24517/00066431">https://doi.org/10.24517/00066431</a>

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 International License.



# 1995 Fiscal Year Final Research Report Summary

---

## Synthesis and Cleavage of the Cyclic Oxalates of 1,2-Glycols.

Research Project

### Project/Area Number

---

06672095

### Research Category

---

Grant-in-Aid for General Scientific Research (C)

### Allocation Type

---

Single-year Grants

### Research Field

---

Chemical pharmacy

### Research Institution

---

Kanazawa University

### Principal Investigator

---

**ITAYA Taisuke** Kanazawa University, Faculty of Pharmaceutical Sciences, Associate Professor, 薬学部, 助教授 (20019657)

### Project Period (FY)

---

1994 - 1995

### Keywords

---

Oxalyl chloride / Cycloalkane-1,2-diol / Cyclic oxalate / Highly selective synthesis / Stereospecific cyclocondensation / Hydrolysis rate

### Research Abstract

---

We have already disclosed that oxalyl chloride reacts with acyclic 1,2-glycols in tetrahydrofuran in the presence of triethylamine to afford a different type of compound as a major product, depending on the structure of the glycol : unsubstituted, monosubstituted, and erythro-disubstituted ethylene glycols provided the cyclic oxalates or polymeric oxalates, while the threoisomers and pinacol afforded the cyclic carbonates.

- 1.The only exception we found was trans-cyclohexane-1,2-diol, which exclusively afforded the cyclic oxalates. This reaction probably proceeded through the tetrahedral intermediate with a boat form, avoiding steric interference between the bridge-head hydrogen and carbonyl oxygen.
- 2.The dramatic reversal of the product ratio was realized in the reaction with pinacol or the threo-compounds by the use of pyridine instead of triethylamine to afford the cyclic oxalates. 1,1'-Oxalyldiimidazole was found to be a good choice for the exclusive formation of the cyclic oxalates. The formation of the polymeric oxalates from the erythro-compounds was completely suppressed by the use of 2,4,6-collidine.
- 3.The cyclic oxalates thus obtained underwent hydrolytic cleavage of the acyl-alkoxy linkage to afford the monoester of oxalic acid at pH 5 at the rate


of 200-1000 times faster than the cyclic oxalate of pinacol. The three-dimensional structure elucidated by X-ray crystal analysis shows that the carbonyl carbons of the cyclic oxalate of pinacol are effectively blocked by two of the four methyl groups.


## Research Products (2 results)

---

All Other

All Publications (2 results)

[Publications] Taisuke Itaya: "Synthesis of the Cyclic Oxalates of 1,2-Glycols by Controlling the Formation of the Cyclic Carbonates" J.Chem.Soc.PerkinTrans.1. 1671-1672 (1994) 

[Publications] T.Itaya: "Synthesis of the Cyclic Oxalates of 1,2-Glycols by Controlling the Formation of the Cyclic Carbonates" J.Chem. Soc., Perkin Trans.1. 1671-1672 (1994) 

**URL:** [https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-06672095/066720951995kenkyu\\_seika\\_hokoku\\_](https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-06672095/066720951995kenkyu_seika_hokoku_)

Published: 1997-03-03