Photolytisch induzierte Reaktionen von CpCo(CO)$_2$ 
(Cp = C$_5$H$_5$, C$_5$H$_4$Me, C$_5$Me$_5$ und C$_5$Ph$_5$) mit Thiiran 
zu dinuklearen 1,2-Ethandithiolato-S,S-Komplexen

Photolytically Induced Reactions of CpCo(CO)$_2$ (Cp = C$_5$H$_5$, C$_5$H$_4$Me, C$_5$Me$_5$ and C$_5$Ph$_5$) 
with Thiirane Yielding Dinuclear 1,2-Ethanedithiolato-S,S Complexes

Stefan Drobnik$^a$, Carola Stoll$^a$, Heinrich Nöth$^a$, Kurt Polborn$^a$, Wolfgang Hiller$^b$ und 
Ingo-Peter Lorenz$^a$

$^a$ Department Chemie und Biochemie der Ludwig-Maximilians-Universität München, 
Butenandtstr. 5 – 13, D-81337 München, Deutschland 
$^b$ Department Chemie, Technische Universität München, Lichtenbergstr. 4, D-85748 Garching, 
Deutschland 


Herrn Professor Hansgeorg Schnöckel zum 65. Geburtstag gewidmet 

The complexes CpCo(CO)$_2$ (Cp = C$_5$H$_5$, C$_5$H$_4$Me, C$_5$Me$_5$ and C$_5$Ph$_5$) (1a – d) react with thiiran C$_2$H$_4$S under UV-irradiation in THF to form the dinuclear µ$_2$-1,2-ethanedithiolate-S,S complexes [(CpCo)$_2$(µ$_2$-S$_2$C$_2$H$_4$)] (2a – d) as main products. Using column chromatography, in case of Cp = C$_5$H$_5$Me also the dimeric complex [C$_5$H$_4$MeCo(µ$_2$-S$_2$C$_2$H$_4$)]$_2$ (3b), in case of Cp = C$_5$Ph$_5$ the mixed disulfido-sulfido complex [(C$_5$Ph$_5$Co)$_2$(µ$_2$-S)(µ$_2$-S)] (4d) were isolated in small yields. Only 2a reversibly adds SO$_2$ gas to form the µ$_2$-SO$_2$ complex [(C$_5$H$_5$CoSCH$_2$)$_2$(µ$_2$-SO$_2$)] (5a). A bromo ligand bridging the Co atoms can be introduced by the reaction of [(C$_5$Me$_5$CoBr$_2$)$_2$] (6c) with 1,2-ethanedithiol which gives the cationic complex [(C$_5$Me$_5$CoSCH$_2$)$_2$(µ$_2$-Br)]CoBr$_4$ (7c). All compounds have been characterized by their IR, $^1$H and $^{13}$C NMR and MS spectra and compounds 2b – d, 3b and 7c by X-ray structure analyses, which prove the pseudo tetrahedral skeleton (CpCoS)$_2$ and the ethane bridge between both sulfur atoms. 3b shows, however, a new unsymmetrical bonding mode of both dithiolato bridges with η$^1$-S und µ$_2$-S ligand functions.

Key words: Cyclopentadienylcobalt Complexes, 1,2-Ethanedithiolato-S,S Bridges, Bromo Bridge, Decarbonylation Reaction, X-Ray Data