Bipodal acylthiourea ligands as building blocks for Bi-, Tetra-, and polynuclear oxorhenium(V) complexes

Nguyen H.H., Thang P.C., Rodenstein A., Kirmse R., Abram U.
Department of Chemistry, Hanoi University of Science, 19 Le Thanh Tong, Hanoi, Viet Nam; Institute of Inorganic Chemistry, University of Leipzig, Johannisallee 29, D-04103 Leipzig, Germany; Institute of Chemistry and Biochemistry, Freie Universität Berlin, Fabeckstrasse 34-36, D-14195 Berlin, Germany

Abstract: Reactions of $(NBu_4)[ReOCl_4]$ and 3,3,3′, 3′-tetraalkyl-1,1′-isophthaloylbis(thioureas), $H_2phth(R_2tu)_2$ where R = Et, i-Bu, in hot MeOH with the addition of Et_3N give red products of the composition $[ReO(OMe)\{phth(R_2tu)_2\}]_2$ (8a, R = Et; 8b, R = i-Bu). X-ray structures of 8 reveal symmetric binuclear complexes containing two almost coplanar organic ligands, each of which coordinates to two rhenium centers via the two bidentate-O,S moieties. The octahedral coordination spheres of the rhenium atoms are completed by each one oxo and one methoxido ligand which are directed perpendicular to the plane defined by the $\{phth(R_2tu)_2\}^{2-}$ ligands. While in 8a, both methoxido ligands point to the same side of the described plane and form a syn isomer, the MeO^- ligands in 8b are located at opposite sides and form an anti isomer. Studies in solution show that there exists a reversible equilibrium between the anti and syn isomers. Dimerization/condensation of complexes 8 with the formation of tetranuclear complexes of the composition $[\{ReO\{phth(R_2tu)_2\}\}_2O]_2$ (9) and/or polynuclear species is observed in solutions, which do not contain MeOH. © 2010 American Chemical Society.

Year: 2011
Source title: Inorganic Chemistry
Volume: 50
Issue: 2
Page : 590-596
Link: Scorpus Link
Correspondence Address: Nguyen, H. H.; Department of Chemistry, Hanoi University of Science, 19 Le Thanh Tong, Hanoi, Viet Nam; email: abram@chemie.fu-berlin.de
ISSN: 201669
CODEN: INOCA
DOI: 10.1021/ic1017642
Language of Original Document: English
Abbreviated Source Title: Inorganic Chemistry
Document Type: Article
Source: Scopus
Authors with affiliations:

- Nguyen, H.H., Department of Chemistry, Hanoi University of Science, 19 Le Thanh Tong, Hanoi, Viet Nam
- Thang, P.C., Department of Chemistry, Hanoi University of Science, 19 Le Thanh Tong, Hanoi, Viet Nam
- Rodenstein, A., Institute of Inorganic Chemistry, University of Leipzig, Johannisallee 29, D-04103 Leipzig, Germany

- Kirmse, R., Institute of Inorganic Chemistry, University of Leipzig, Johannisallee 29, D-04103 Leipzig, Germany
- Abram, U., Institute of Chemistry and Biochemistry, Freie Universität Berlin, Fabeckstrasse 34-36, D-14195 Berlin, Germany

References:

- Beyer, L., Hoyer, E., Liebscher, J., Hartmann, H., (1981) Z. Chem., 21, p. 228
- Koch, K.R., (2001) Coord. Chem. Rev., 216-217, p. 473
- Beyer, L., Hoyer, E., Hennig, H., Kirmse, R., Hartmann, H., Liebscher, J., (1975) J. Prakt. Chem., 317, p. 829
- Schmidt, S., Dietze, F., Hoyer, E., (1991) Z. Anorg. Allg. Chem., 603, p. 33
- Mohamadou, A., Dechamps-Olivier, I., Barbier, J.P., (1994) Polyhedron, 13, p. 1363
- Del Campo, R., Criado, J.J., Gheorghe, R., Gonzalez, F.J., Hermosa, M.R., Sanz, F., Manzano, J.L., Rodriguez-Fernandez, E., (2004) J. Inorg. Biochem., 98, p. 1307
- Del Campo, R., Criado, J.J., Garcia, E., Hermosa, M.R., Jimenez-Sanchez, A., Manzano, J.L., Monte, E., Sanz, F., (2002) J. Inorg. Biochem., 89, p. 74
- Emen, F.M., Flörke, U., Külcü, N., Arslan, H., (2003) Acta Crystallogr., 59, p. 582
- Arslan, H., Flörke, U., Külcü, N., (2004) Z. Kristallogr., New Cryst. Struct., 219, p. 409
- Arslan, H., Vanderveer, D., Emen, F., Külcü, N., (2003) Z. Kristallogr., New Cryst. Struct., 218, p. 479
- Fitzl, G., Beyer, L., Sieler, J., Richter, R., Kaiser, J., Hoyer, E., (1977) Z. Anorg. Allg. Chem., 433, p. 237
- Irving, A., Koch, K.R., Matoetoe, M., (1993) Inorg. Chim. Acta, 206, p. 193
- Sacht, C., Datt, M.S., Otto, S., Roodt, A., (2000) J. Chem. Soc., Dalton Trans., p. 727
- Arslan, H., Külcü, N., Flörke, U., (2003) Trans. Met. Chem., 28, p. 816
- Schröder, U., Richter, R., Anguio-Conejo, J., Lino-Pacheco, M., Gullien, A., (2003) Z. Anorg. Allg. Chem., 629, p. 1081
- Richter, R., Sieler, J., Köhler, R., Hoyer, E., Beyer, L., Leban, I., Golic, L., (1989) Z. Anorg. Allg. Chem., 578, p. 198
- Rodenstein, A., Richter, R., Kirmse, R., (1713) Z. Anorg. Allg. Chem., 2007, p. 633
- Bourne, S.A., Hallale, O., Koch, K.R., (2005) Cryst. Growth Des., 5, p. 307
- Rodenstein, A., Griebel, J., Richter, R., Kirmse, R., (2008) Z. Anorg. Allg. Chem., 634, p. 867
- Koch, K.R., Bourne, S.A., Coetzee, A., Miller, J., (1999) J. Chem. Soc., Dalton Trans., 18, p. 3157
- Koch, K.R., Hallale, O., Bourne, S.A., Miller, J., Bacsa, J., (2001) J. Mol. Struct., 561, p. 185
- Hallale, O., Bourne, S.A., Koch, K.R., (2005) New J. Chem., 29, p. 1416
- Dilworth, J.R., Lewis, J.S., Miller, J.R., Yifan, Z., (1993) Polyhedron, 12, p. 221
- Abram, U., Abram, S., Alberto, R., Schibli, R., (1996) Inorg. Chim. Acta, 248, p. 193
- Nguyen, H.H., Abram, U., (2008) Z. Anorg. Allg. Chem., 634, p. 1560
- Huy, N.H., Abram, U., (2007) Inorg. Chem., 46, p. 5310
- Alberto, R., Schibli, R., Egli, A., Schubiger, P.A., Herrmann, W.A., Artus, G., Abram, U., Kaden, T.A., (1995) J. Organomet. Chem., 217, p. 492
- Köhler, R., Kirmse, R., Richter, R., Sieler, J., Hoyer, E., Beyer, L., (1986) Z. Anorg. Allg. Chem., 537, p. 133
- Sheldrick, G.M., (1997) SHELXS-97 and SHELXL-97, Programs for the Solution and Refinement of Crystal Structures, , University of Göttingen: Göttingen, Germany
- Allen, F.H., Kennard, O., Watson, D.G., Brammer, L., Orpen, A.G., Taylor, R., (1987) J. Chem. Soc., Perkin Trans., 2, p. 1
- Abram, U., Rhenium (2003) Comprehensive Coordination Chemistry II, 5, p. 271. , McCleverty, J. A. and Mayer, T. J., Eds.
- Elsevier: Amsterdam, The Netherlands
- Abram, S., Abram, U., Schulz Lang, E., Strähle, J., (1995) Acta Crystallogr., 51, p. 1078. , references cited therein
- Paulo, A., Domingos, A., Marcalo, J., Pires De Matos, A., Santos, I., (1995) Inorg. Chem., 34, p. 2113

- Braband, H., Blatt, O., Abram, U., (2006) Z. Anorg. Allg. Chem., 632, p. 2251
- Lawrence, A.B., Paul, E.W., Grant, N.H., (1997) Inorg. Chim. Acta, 255, p. 149
- Benny, P.D., Barnes, C.L., Piekarski, P.M., Lydon, J.D., Jurisson, S.S., (2003) Inorg. Chem., 42, p. 6519
- Gerber, T.I.A., Tshentu, Z.R., Garcia-Granda, S., Mayer, P., (2003) J. Coord. Chem., 56, p. 1093
- Schroer, J., Wagner, S., Abram, U., (2010) Inorg. Chem., 49, p. 10694