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Redox interconversion between metal thiolate and disulfide compounds

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Title: Redox interconversion between metal thiolate and disulfide compounds

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Propositions (Stellingen)

Accompanying the thesis

Redox interconversion between metal thiolate and disulfide compounds

1. It is remarkable that a Cu(II) thiolate compound is isolated from an acetonitrile solution in a quite high yield, whereas the authors state that a Cu(I) disulfide compound is present as the main species in this solvent.
A. M. Thomas et al. J. Am. Chem. Soc. 135(2013), 18912-18919
2. Reports describing diamond type $[\text{Cu}^{\text{II}}_2\text{S}_2]$ compounds should also consider the possibility of formation of Cu(I) disulfide compounds.
P. Houser et al. J. Am. Chem. Soc., 118 (1996) 2101-2102.
3. It is not possible to predict the position of the redox interconversion between cobalt(III) thiolate and cobalt(II) disulfide compounds triggered by chloride anions, as different ligand systems yield different results.
M. Gennari et al. Angew. Chem. Int. Ed., 53 (2014) 5318-5321; This thesis, Chapter 2.
4. The redox interconversion reactions of copper(II) thiolate compounds, are dictated by other physical properties than those of cobalt(III) thiolate compounds.
A. M. Thomas et al. J. Am. Chem. Soc. 135(2013), 18912-18919; E.C.M. Ordning-Wenker et al. Inorg. Chem., 53 (2014) 8494-8504; This thesis, Chapter 3
5. Although the redox interconversion reactions have successfully been extended to cobalt and iron compounds, the mechanism of these reactions still needs to be clarified.
L. Wang, Chem. Eur. J., 24 (2018), 11973-11982; This thesis, Chapters 2 and 3
6. It is challenging to predict the final oxidation products of metal disulfide compounds.
This thesis, Chapter 4
7. Color is not a good indicator to distinguish cobalt(III) thiolate from cobalt(II) disulfide compounds.
This thesis, Chapter 3

8. One should be aware of the potential decomposition of the tetrafluoridoborate anion when using it in the synthesis of coordination compounds.
This thesis, Chapter 5
9. Great patience is required to grow single crystals.
10. Many things seem impossible until it is done.

Feng Jiang

Leiden, December 7, 2018