Synthesis of Novel Tetracarboxylato Dirhenium(III) Compounds and Crystal Structure of $[\text{Re}_2(1\text{-Adamantylcarboxylate})_4\text{Cl}_2] \cdot 4\text{ CHCl}_3$

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The coordination compounds of the general formula $\text{Re}_2(L)_4X_2$ ($X = \text{Cl}, \text{Br}; L = 1$-adamantylcarboxylate and 1-adamantylacetate) have been prepared and characterized by means of UV-VIS spectroscopy ($20000 \text{ cm}^{-1}, \delta \to \delta^*$). The crystal and molecular structure of $\text{Re}_2(\text{AdCOO})_4\text{Cl}_2 \cdot 4\text{ CHCl}_3$ solvate was determined by X-ray diffraction. The units $\text{Re}_2(\text{AdCOO})_4\text{Cl}_2$ adopt a centrosymmetric dinuclear array with each metal atom coordinated in a distorted octahedron comprising one rhenium and one chlorine atoms ($\text{Re}-\text{Cl} 2.505(2) \text{ Å}$) and four carboxylate oxygen atoms in the equatorial plane. The rhenium-rhenium separation of 2.2300(5) Å corresponds to quadruple bond between the metal atoms. All Re-O bonds have an almost uniform length ($2.017(4) - 2.032(4) \text{ Å}$) and do not differ essentially from the parameters reported for related compounds. The closest environment of the $\text{Re}_2(\text{AdCOO})_4\text{Cl}_2$ molecules in the crystal comprises weak Cl- - -HC hydrogen bonds with the chloroform molecules and significantly shortened van der Waals contacts Cl- - -Cl, 3.46 Å.