

$[(C_6Me_6)_2Hg_2](AlCl_4)(Al_2Cl_7)$ and $[(o-C_6H_4Me_2)_2(p-C_6H_4Me_2)Hg_2](Al_4O_2Cl_{10})$ - two organometallic mercury(I) complexes with unique structural features

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Extending former investigations^[1,2,3] we synthesized two new organometallic mercury(I)-complexes, which were characterized by single crystal X-ray crystallography.

The reaction of Hg_2Cl_2 with an excess of $AlCl_3$ in a solution of hexamethylbenzene in toluene at 100 °C results in an orange solution, from which very moisture sensitive orange crystals of the complex $[(C_6Me_6)_2Hg_2](AlCl_4)(Al_2Cl_7)$ (**1**) can be grown. The compound crystallizes in the orthorhombic space group $Pnma$ with the lattice parameters $a = 27,651(2)$ Å, $b = 15,3519(8)$ Å, $c = 9,1199(5)$ Å.

The reaction of Hg_2Cl_2 and $AlCl_3$ (molar ration 1:2) in a 1:3 mixture of *o*- and *p*-xylene yields a light yellow solution. After a few weeks moisture sensitive light yellow crystals of the compound $[(o-C_6H_4Me_2)_2(p-C_6H_4Me_2)Hg_2](Al_4O_2Cl_{10})$ (**2**) are formed. **2** crystallizes in the monoclinic space group $P2_1/c$ with the lattice parameters $a = 18,590(1)$ Å, $b = 9,7951(4)$ Å, $c = 21,726(1)$ Å and $\beta = 100,886(8)^\circ$. The presence of the decachloridodioxotetraaluminate anion is probably due to slow hydrolysis of the reaction mixture.

Earlier studies of the reaction system $Hg_2Cl_2/AlCl_3/C_6Me_6$ ^[3] had led to a complex $[(C_6Me_6)_2Hg_2](AlCl_4)_2$, where the hexamethylbenzene molecules coordinate in the terminal position of the Hg_2^{2+} cation. Both anions are bonded to this arene solvated Hg_2^{2+} -ion and are not involved in further bonding interactions.

In the solid of **1** the hexamethylbenzene ligands are bonded to the mercury atoms in the direction of the Hg-Hg bond vector in a $\eta^1/quasi-\eta^3$ coordination mode. The cationic complexes are interconnected by the $AlCl_4^-$ anions, the $Al_2Cl_7^-$ anion is coordinated to both the Hg atoms, but not involved in further interactions.

In the solid of **2** the *o*-xylene ligands occupy the primary coordination site along the Hg-Hg bond vector, while the *p*-xylene molecule bridges the two Hg atoms of the cation in a $\eta^2: \eta^4$ coordination mode. The anions act as bridging units between neighbouring Hg_2^{2+} dumbbells.

Literatur:

[1] W. Gulewitsch, *Ber. Dtsch. Chem. Ges.* **1904**, 37, 1560. [2] R. W. Turner, E. L. Amma, *J. Inorg. Nucl. Chem.* **1966**, 28, 2411. [3] W. Frank, B. Dincher, *Z. Naturforsch. B.* **1987**, 42, 828.