

Kristallstrukturen von Octacyanomolybdaten(IV) [1].

V. Quadratisch-antiprismatische $[\text{Mo}(\text{CN})_8]$ -Koordination in den cyanoverbrückten Kupfer- und Cadmium-Amminkomplexen

$\text{Cu}_2(\text{NH}_3)_8[\text{Mo}(\text{CN})_8]$ und $\text{Cd}_2(\text{NH}_3)_6[\text{Mo}(\text{CN})_8]\cdot\text{H}_2\text{O}$

Crystal Structures of Octacyanomolybdates(IV) [1]. V. Square Antiprismatic $[\text{Mo}(\text{CN})_8]$ -Coordination of the Cyano-Bridged Copper and Cadmium

Ammine Complexes $\text{Cu}_2(\text{NH}_3)_8[\text{Mo}(\text{CN})_8]$ and $\text{Cd}_2(\text{NH}_3)_6[\text{Mo}(\text{CN})_8]\cdot\text{H}_2\text{O}$

Wilmar Meske, Dietrich Babel*

Fachbereich Chemie und Wissenschaftliches Zentrum für Materialwissenschaften der Philipps-Universität Marburg, Hans-Meerwein-Straße, D-35043 Marburg

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Crystal Structure, Octacyanomolybdate(IV), Cyano Bridged Ammine Cations, Copper(II), Cadmium

At single crystals of the cyano complexes $\text{Cu}_2(\text{NH}_3)_8[\text{Mo}(\text{CN})_8]$ ($a = 934.1(4)$, $b = 1595.9(3)$, $c = 1391.9(4)$ pm, $\beta = 90.57(2)^\circ$, monoclinic space group Cc, $Z = 4$) and $\text{Cd}_2(\text{NH}_3)_6[\text{Mo}(\text{CN})_8]\cdot\text{H}_2\text{O}$ ($a = 1708.7(12)$, $b = 1307.8(4)$, $c = 942.9(3)$ pm, orthorhombic space group Pna $_2$, $Z = 4$) X-ray structure determinations were performed at temperatures of about 175 K. Both compounds, prepared at about 275 K in aqueous ammonia solutions and easily decomposing, exhibit distorted square antiprismatic $[\text{Mo}(\text{CN})_8]^{4-}$ coordination of closely resembling dimensions (mean distances Mo-C: 215.7 and 215.3 pm, resp.). The anions are bridged by ammine cations to form chains in the copper and a three-dimensional framework in the cadmium compound. Some of the cyano bridges are strongly bent (C-N-M^{II} as small as 124° and 130°, resp.). The distorted M^{II} coordination is square pyramidal and elongated octahedral in the case of the two copper atoms (Cu-N ranging from 197 to 257 pm, three and five ligands, respectively, being NH₃). In the case of cadmium both metal atoms are octahedrally coordinated, one exhibiting mer-, the other fac-arrangement of three NH₃ and three NC-ligands (Cd-N ranging from 229 to 247 pm, mean 235 pm for either cadmium atom). The findings are compared with related compounds and further details are discussed.

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