

Organozinc Siloxide-Hydrazide Aggregates $[(RZn)_4(NHNMe_2)_x(OSiMe_3)_{(4-x)}]$

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Dedicated to Professor Wolfgang Jeitschko on the occasion of his 70th birthday

The reaction of dialkylzinc compounds R_2Zn ($R = Me, Et$) with *N,N*-dimethylhydrazine and trimethylsilanol in a 4:2:2 ratio leads to the formation of tetra(alkylzinc) tris-siloxide monohydrazide aggregates, $[(RZn)_4(NHNMe_2)(OSiMe_3)_3]$ [$R = Me$ (**1**) and Et (**2**)]. These compounds are aggregates of mirror symmetry, containing the novel $Zn_4N_2O_3$ core. Both compounds have been characterised by 1H , ^{13}C and ^{29}Si NMR and IR spectroscopy, by mass spectrometry and by elemental analysis, and **2** also by X-ray crystallography. The structure can be derived from a heterocubane, in which one anionic vertex is replaced by an $NHNMe_2$ group contributing two N atoms to the core constitution. By applying a ratio of hydrazine:silanol of 2:1 in a reaction with R_2Zn ($R = Me, Et, iPr$), compounds of the general formula $[(RZn)_4(NHNMe_2)_2(OSiMe_3)_2]$ [$R = Me$ (**3**), Et (**4**), iPr (**5**)] are obtained. These aggregates contain a $Zn_4N_4O_2$ core. Upon employing a hydrazine:silanol ratio of 5:1 in a reaction with diisopropyl zinc, the compound $[(iPrZn)_4(NHNMe_2)_3(OSiMe_3)]$ results, containing a Zn_4N_6O unit. Compounds **3–6** have been characterised by 1H , ^{13}C and ^{29}Si NMR and IR spectroscopy, by mass spectrometry and by elemental analysis. The topologic relationship between the pure hydrazides $[(RZn)_4(NHNMe_2)_4]$, the mixed aggregates $[(RZn)_4(NHNMe_2)_3(OR')]$, $[(RZn)_4(NHNMe_2)_2(OR')_2]$ and $[(RZn)_4(NHNMe_2)_3(OR')_3]$ and the pure alkoxides $[(RZn)_4(OR')_4]$ is discussed.

Key words: Siloxidehydrazide, Zinc, Cage Compounds, Organometallic Chemistry, Trimethylsilanol