

An efficient process to directly convert 1-hydroxymethyl-3,5-dimethylpyrazole to Cd(II) complexes *via* C-N bond creation: cytotoxicity and factors controlling the structures.

Autorzy

Joanna Masternak

Barbara Barszcz

Wanda Sawka-Dobrowolska

Joanna Wietrzyk

Julia Jezierska

Magdalena Milczarek

Rok wydania

2014

Czasopismo

RSC Advances

Numer woluminu

4

Strony

43962-43972

DOI

10.1039/C4RA07960D

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

We have demonstrated a simple process that involves one-pot, one-step reactions leading to efficient preparation of new cadmium complexes with N4-donating ligands $[CdX_2L^1]$ ($X = I^-$ (**1**), Br^- (**2**) $L^1 = tris(1-(3,5-dimethylpyrazolyl)methyl)amine$). The most prominent feature of the synthesis is the *in situ* formation of a new organic tripodal ligand (L^1) in a condensation reaction between a starting ligand (1-hydroxymethyl-3,5-dimethylpyrazole) and ammonia. A single-crystal X-ray analysis confirmed that the complexes obtained are monomers (**1**, **2**) with octahedral geometry of the cadmium centres. Complex **3** has a cationic–anionic structure $[Cu(LOH)_2CH_3OH][CdCl_4]$ and has been synthesised by the reaction of CdO and NH_4Cl in the presence of zerovalent copper (powder). IR, EPR, 1H and ^{13}C NMR, as well as simultaneous TG/DTG were carried out to characterise the products. Moreover, we try to compare the cytotoxic profile of CdO and cadmium salts with Cd(II) complexes. Besides $[CdX_2L^1]$ (**1**, **2**) we take into consideration $[Cd_2(L^2)_2(SCN)_4(MeOH)_2]_n$ (**4**) and $[Cd(SCN)_2L^1]$ (**5**) complexes. Biological studies demonstrated that Cd(II) complexes with the *N*-scorpionate ligand (**1**, **2** and **5**) have similar cytotoxicity, which points to a structure–cytotoxicity relationship. Thus, all the complexes (except **4**) exhibited a lower cytotoxic activity compared to a cadmium ion in salts.

Adres publiczny

<http://dx.doi.org/10.1039/C4RA07960D>

Strona internetowa wydawcy

<https://www.rsc.org/>