# Crystal Structure and Magnetic Property of $Co(C_{10}H_{21}N_2)Cl_3$ – a New Cobalt-cyclic Diamine

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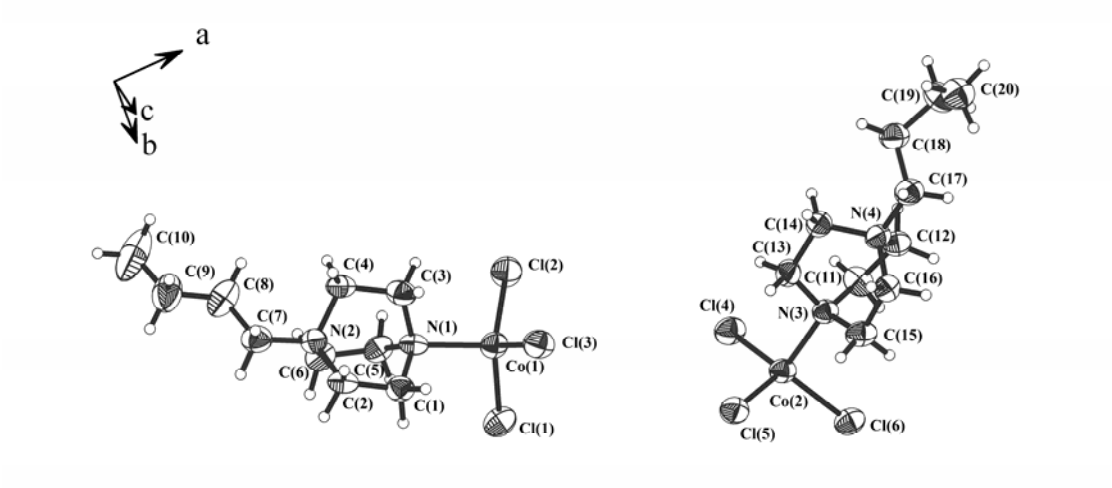
A new hydrogen bonded framework of cobalt complex, $Co(C_{10}H_{21}N_2)Cl_3$, was readily synthesized under solvothermal condition. The crystal crystallizes in monoclinic $P2_1$ with unit cell parameter $a$ = 8.379(2) Å, $b$ = 12.1090(13) Å, $c$ = 14.711(4) Å, $\beta$ = 91.683(4)°, $V$ = 1492.0(6) Å$^3$ and Z = 4. The crystal structure composes of two different $Co(C_{10}H_{21}N_2)Cl_3$ building motifs, constructed from the tetrahedral cobalt center and chloride and 1-butyl-1-azania-4-azabicyclo[2.2.2]octane as coordinating ligands, the latter of which is formed *in situ*. The two motifs can be differentiated by the Fisher projection of the butyl groups. Weak hydrogen bonds of both inter- and intra- building motifs can be identified, and may account for the thermal stability (up to 360°C). The cobalt centers show roughly paramagnetic coupling with a small asymmetric hysteresis. The maximum molar susceptibility of 18.32 x $10^{-3}$ emu.mol$^{-1}$ at zero applied field can be calculated.




Asymmetric unit of $Co(C_{10}H_{21}N_2)Cl_3$