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Zurich, SwitzerlandKristian Handoyo Sugiyarto et al., J Org Inorg Chem 2018, Volume 4
DOI: 10.21767/2472-1123-C5-014**STRUCTURAL STUDY ON POWDERED COMPLEX OF [Cu(PHEN)₃]
(CF₃COO)₂·2.4H₂O****Kristian Handoyo Sugiyarto, Hestina W and Cahyorini K**

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The blue powdered complex of hydrated tris-phenanthroline(II) trifluoroacetate has been isolated by interaction of the corresponding nitrate salt in aqueous solution and slightly excess of bipyridine in ethanol on the addition of an excess of saturated potassium triflate solution and reducing the solvent. The thermogravimetric analysis/differential thermal analysis (TGA/DTA) confirmed the loss of 4.983% mass of the complex corresponding to 2.4 H₂O (0.6% error), while atomic absorption spectroscopy (AAS) measurement showed the content of metal to be 6.24% corresponding to the theoretical value of 7.28% (14.28% error) in [Cu(phen)₃](CF₃COO)₂·2.4H₂O. Moreover, the analysis of conductance producing the charge ratio of cation by anion to be 2:1, clearly confirms the formula. The magnetic moment, *eff*, of this complex which was to be 1.95-1.99 BM, indicates that the complex is paramagnetic corresponding to an unpaired electron. UV-Vis spectrum of the complex reveals the only one absorption observed at about 677 nm (14770 cm⁻¹), being associated with the spin allowed transition, ²E_g → ²T_{2g}. The extinction coefficient of 57.8 Lmol⁻¹cm⁻¹ indicates the adoption of octahedral environment in this complex. The infrared spectrum shows absorptions of ligand group which is influenced by the metal-ligand interaction in this complex. The powder XRD analysis of this complex was refined by Rietica-Le Bail method and found to be fit as triclinic crystal system and space group of

PI, with parameters of a=10.8985 Å, b=41.0532 Å, c=16.1082 Å, α=98.2720°, β=91.9544°, γ=82.4071°, V=7068.8295Å³, Z=1, Rp=1.83 and Rwp=5.70 Rexp=0.37. The goodness of the fitting, GOF=231.4, was also reflected by the derived Bragg R-Factor of 0.03.

Biography

Kristian Handoyo Sugiyarto gained his Drs. degree from Yogyakarta State University (UNY), Indonesia in 1978; while appointed to the Academic Staff of UNY (1979), he undertook MSc program in 1984-1987, and then continued to the PhD program in 1989-1992, both at the Department of Inorganic Chemistry, the School of Chemistry, UNSW, Australia, under the supervision of Prof. H A Goodwin. He then undertook a three-six-month Postdoctoral Research, again with Prof. H A Goodwin, 1995-1997. More than 20 international publications dealing with spin-crossover in iron(II) and some education were published in various international journal Scopus indexed, while more than 15 articles published in local-national journals. He also undertook another six-month research in structural study by EXAFS analysis with Prof. Makoto Kurihara at Shizuoka University and with Prof. Saito A at Tokyo Gakugei University, 2002-2003. He also undertook a four-month Academic Recharging Program for doing palladium complex with Prof. Stephen B Colbran at the School of Chemistry, UNSW, Australia, 2009-2010. He has also presented in several international conference in Paris, Rome, UPSI Malaysia, Bangkok Thailand.

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