Copper(II) Acetate
Compiled by Mojtaba Amini

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Dedicated to my supervisor Prof. Mojtaba Bagherzadeh.

Introduction

Copper(II) acetate, or cupric acetate, is a dark green crystalline solid with the formula Cu(OAc)₂. X-ray measurements indicate that this compound is monoclinic with space group C2/c and unit-cell dimensions a = 13.15, b = 8.52, c = 13.90 Å.¹

Copper(II) acetate monohydrate is produced by the reaction of copper(II) carbonate or copper(II) hydroxide with a solution of acetic acid or by the reaction of copper(II) oxide with hot dilute acetic acid. Copper(II) acetate is used as a textile dyeing, ceramic pigment and catalyst in organic reactions.²

Abstract

(A) Chakraborty and co-workers have developed a green method for the bulk ring-opening polymerization of lactides in the presence of Cu(OAc)₂ as a good catalyst to synthesize polymers with different end-terminal groups.³ These polymerizations are highly controlled leading to the formation of polymers with the expected number of average molecular weights and narrow molecular weight distribution.

(B) Garden and co-workers have found that the oxidative addition of anilines with 1,4-naphthoquinone to give N-aryl-2-amino-1,4-naphthoquinones can be performed in the presence of catalytic amounts of copper(II) acetate.⁴ All the reactions are generally more efficient in that they are cleaner, higher yielding, and faster.

(C) Wu and co-workers have developed a novel copper-catalyzed protocol for the synthesis of carbinal derivatives.⁵ In the presence of copper(II) acetate and dpff, carbinal derivatives were prepared by the addition of aryboronic acids to aromatic aldehydes in good to excellent yields.

(D) The reactivity of copper(II) acetate as catalyst in standard C–O and C–N coupling reactions has been developed systematically.⁶

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Chemler and colleagues have found that Cu(OAc)$_2$ is an excellent promoter for the intramolecular amination of olefins using sulfamide substrates$^7$ and oxidative cyclization of N-sulfonylated aromatic systems.$^8$

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\begin{align*}
&\text{solvent, 48 h, 90 °C} \\
\text{Cu(OAc)$_2$,} \\
&\text{solvent, 24 h, 120 °C}
\end{align*}
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References

(2) Wayne Richardson, H. *Copper Compounds*, In *Ullmann’s Encyclopedia of Industrial Chemistry*; Wiley-VCH: Weinheim, **2005**.