Metformin (C$_4$H$_{11}$N$_5$) is a first choice as antihyperglycemic drug in the treatment of patients with diabetes mellitus type II. Its mechanism of action is not yet clearly defined, but it has been suggested that metformin suppress mitochondrial respiration by inhibition of complex I, reducing the hepatic gluconeogenesis and the transport of active metabolites [1]. The metformin could be intercalated in a laminar material as hydrotalcite clays. The hydrotalcites have a basic character and they can be dissolved slowly in the acid medium of the stomach, delivering the metformin in a controlled way into the human bloody system. Hydrotalcites are anionic clays consisting of divalent and trivalent metal hydroxides, where magnesium and aluminum are the most common. Magnesium can be substituted by copper to promote a highly porous material. The hydrotalcite structure is formed by the stacking of metal hydroxide sheets positively charged, which are neutralized by exchangeable interlayered anions as CO$_3^{2-}$ or NO$_3^{1-}$, commonly hydrated [2]. These materials could then accommodate the metformin between layers and/or in the mesopores located in the external surface of the particles.

In this work, hydrotalcites containing copper were impregnated with metformin by simultaneous co-precipitation and by adsorption methods. The materials crystallization were carried out by microwave irradiation. The promising bioactive materials were characterized by X-ray diffraction, nitrogen physisorption and FTIR spectroscopy. It was found that the interaction of metformin with hydrotalcites depended on the metformin impregnation method as well as the materials porosity.

**Keywords:** Metformin, hydrotalcites, diabetes

**References:**


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