

Synthesis and characterization of hybrid cadmium compounds exhibiting intense fluorescence

E. Apostolou^{a,b}, T. Mauromoustakos^b, G. Mousdis^a

^a National Hellenic Research Foundation, Theoretical and Physical Chemistry, Athens, Greece

^b Laboratory of Organic Chemistry, Department of Chemistry, National and Kapodistrian University of Athens, Panepistimioupolis Zografou, 11571 Athens, Greece
e-mail: ektorasapostolou13@gmail.com

In recent years, considerable research has been carried out on hybrid compounds of halogenated metals that exhibit a structure similar to perovskites. The design of these compounds provides the possibility to combine organic and inorganic elements at the molecular level to prepare materials with excellent desirable properties [1]. Such materials, mainly based on lead, have been used for the fabrication of photovoltaics, LEDs, photosensors and other devices. However, due to the instability and toxicity of these compounds as well as to broaden their potential applications, research was extended to similar materials with different metal.

Compounds of this type with cadmium have been little studied although they present interesting properties [2,3].

In this work we synthesized and characterized compounds of the A_xCdX_{2+x} type (A: benzylamine and X: Cl, Br, I). In order to achieve an increase in the fluorescence of these compounds we introduced structural defects by partial replacement of divalent Cd with trivalent Sb. Based on this methodology we prepared materials with intense and relatively broad fluorescence spectra.

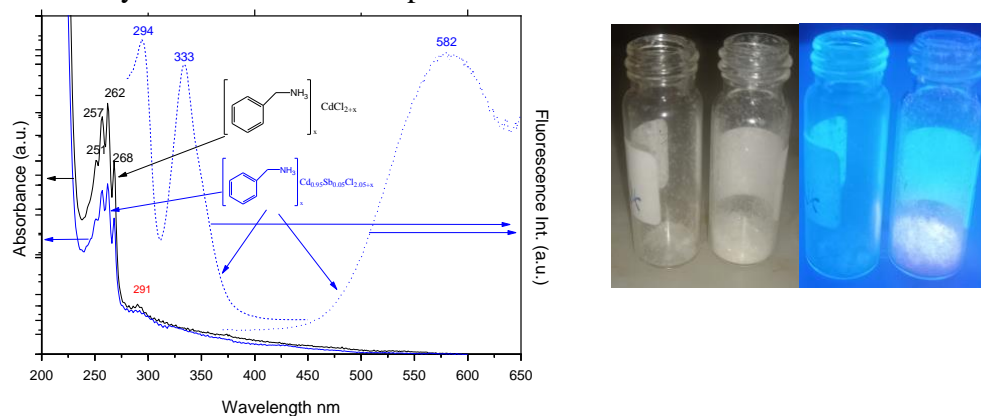


Figure 1: Absorption, fluorescence and excitation spectra (left) and photographs under normal light and under UV for the pure and the Cl- "doped" material (right)

References:

1. G. C. Papavassiliou, G. A. Mousdis, I. Koutselas "[Halide Perovskites: Photovoltaics, Light Emitting Devices, and Beyond](#)," Tze-Chien Sum and Nripan Mathews, (Ed.), Wiley-VCH Verlag GmbH & Co. KGaA. **2019**, Chapter 1.1 ISBN: **978-3-527-3411**
2. Yangui, A. Pillet, S. Bendeif, E.-E. Lusson, A., Triki, S., Abid, Y. Boukhedden, K. ACS Photonics 5(4), (2018) 1599-1611.
3. Chu, K. Zhou, Y.-H., Song, J.-L. Zhang, C., Polyhedron 131, (2017) 22-26.