

*Designing 2D organic-inorganic structures: piperidinium derivatives of lead chlorides*Paweł Socha¹, Lukasz Dobrzycki¹, Michał Ksawery Cyranski¹¹Czocharalski Laboratory Of Advanced Crystal Engineering, Faculty Of Chemistry, Un, Warsaw, Poland

E-mail: psocha@chem.uw.edu.pl

Organic-inorganic hybrids of metals halide complexes and amine hydrohalides are fascinating objects with many possibilities to create different kind of crystal structures. Depending on the size and shape of an organic cation we can obtain 1D, 2D or 3D architecture. This kind of structures are particularly interesting, as they may exhibit many interesting properties like electric, optic or magnetic and notably they may be used in the industry for example as semiconductors or parts of solar cells.[1] A key question appears how does a small modification of an organic cation influence crystalline structure and also physicochemical properties of such systems. In this report we concentrate on lead chloride derivatives. Piperidine is a six-membered heterocyclic aliphatic amine, which may be relatively easily modified by substitution e.g. by methyl group in various position(s) in respect to the nitrogen atom. In this report we present 6 new crystal structures of methyl derivatives of piperidinium lead chlorides or hydrochlorides, together with a newly determined parent piperidinium hydrochloride, which structure has already been known [2]. Based on our experimental and literature data we elucidate the factors influencing the crystal structure formation of these kind of systems and play with them to create 2D layered arrangements. Our work to obtain new organic-inorganic crystals of that kind is still in progress.

[1] Noh J. H., Im S. H., Heo J. H., Mandal T. N., Seok S. I. (2013) *Nano Lett.*, 13 (4), 1764–1769

[2] Dattagupta J.K., Saha N.N., *J. Cryst. Mol. Struct.* (1975) 5, 177-189

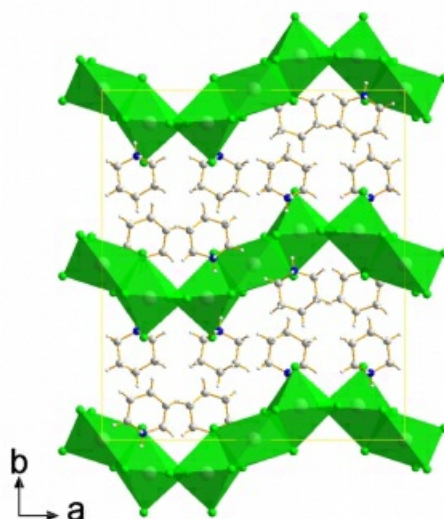


Figure 1. 2D crystal structure of piperidinium lead chloride

Keywords: [hybrid organic-inorganic lead chloride](#), [crystal structure](#), [crystal engineering](#)